

Longshoring Industry



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Abstract This booklet provides a generic, non exhaustive overview of a particular standards-related topic. This publication does not itself alter or determine compliance responsibilities, which are set forth in OSHA standards themselves, and the Occupational Safety and Health Act. Moreover, because interpretations and enforcement policy may change over time, for additional guidance on OSHA compliance requirements, the reader should consult current administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the courts. Material contained in this publication is in the public domain and may be reproduced, fully or partially, without the permission of the Federal Government. Source credit is requested but not required.		
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Longshoring Industry

U.S. Department of Labor
Elaine L. Chao, Secretary

OSHA 2232
2001 (Revised)

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Section 1917.28 also issued under 5 U.S.C. 553.

Section 1917.29 also issued under Sec. 29, *Hazardous Materials Transportation Uniform Safety Act of 1990* (49 U.S.C.1801-1819 and 5 U.S.C. 553).

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Authority: Secs. 4, 6, and 8 of the *Occupational Safety and Health Act of 1970*, 29 U.S.C. 653, 655, 657; *Walsh-Healey Act*, 41 U.S.C. 35 et seq.; *Service Contract Act of 1965*, 41 U.S.C. 351 et seq.; Sec. 107, *Contract Work Hours and Safety Standards Act (Construction Safety Act)*, 40 U.S.C. 333; Sec. 41, of *Longshore and Harbor Workers' Compensation Act*, 33 U.S.C. 941; *National Foundation of Arts and Humanities Act*, 20 U.S.C. 951 et seq.; Secretary of Labor's Order No. 6-96 (62 FR 111) and 29 CFR part 1911.

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Foreword

This booklet contains all the safety and health standards concerning the marine terminal and longshoring industries, as contained in *Title 29 Code of Federal Regulations (CFR) Parts 1917 and 1918*, as of June 30, 2000. Also, included are brief discussions about:

1. The importance of training in establishing and reinforcing employee awareness of job safety and health (see “What Other Help Does OSHA Provide?”).
2. The elements of a safety and health program that can be used by employers to develop effective programs at their work sites (see “Guidelines for Workplace Safety and Health Programs in the Marine Terminal and Longshoring Industries”).
3. OSHA’s onsite consultation program that is available to employers (see “What Other Help Does OSHA Provide?”).

Hazards not covered by Marine Terminal and Longshoring Industry standards may be covered by general industry standards contained in 29 CFR Part 1910 (see §1917.1 or §1918.1, as applicable, for 1910 standards that can be cited). Where a particular marine terminal or longshoring hazard also is covered by general industry standards, only the marine terminal or longshoring standard is cited by OSHA inspectors (described in more detail in 29 CFR Part 1910.5).

In addition, OSHA regulations regarding general agency practices and procedures are applicable to marine terminal and longshoring industry employment, directing particular attention to the provisions of 29 CFR Part 1904, “Recording and Reporting of Occupational Injuries and Illnesses.”

The marine terminal and longshoring standards cover employees of employers that perform marine cargo handling operations on shore or aboard vessels.

States administering their own occupational safety and health programs through plans approved under Section 18(b) of the *Act* must adopt standards and enforce requirements that are at least as effective as Federal requirements. There are currently 26 states and territories with approved state plans: 23 cover private and public sectors and 3 cover state and local government employees only (see the list of states and territories with approved plans at the end of this booklet).

Maritime Coverage Under State Plans

Most states with federally approved safety and health plans have chosen not to extend their coverage to maritime employment. In those jurisdictions, state plans cover only state and local government maritime workers. Federal OSHA retains responsibility for all other maritime coverage. A few state plans include some coverage for private sector onshore maritime workers. For a detailed summary of maritime coverage under particular state plans, see Title 29 CFR Part 1952. These regulations and other OSHA information are also available online at www.osha.gov.

The guidelines for safety and health programs are for informational purposes only. These guidelines are not mandatory.

Guidelines for Workplace Safety and Health Programs in the Marine Terminal and Longshoring Industries¹

Data and studies show that effective workplace safety and health programs can substantially reduce worker deaths, injuries, and illnesses and their associated costs. As a result, many states have regulations and guidelines concerning occupational safety and health programs. Occupational safety and health organizations and professionals as well as insurance companies also have programs. These programs are called, among other things, accident prevention programs, injury and illness prevention programs, loss control programs, and total quality management programs.

The core function of any workplace safety and health program is to “find and fix” hazards that endanger employees and to implement systems, procedures, and processes that prevent hazards from recurring or being introduced into the workplace. This element of a worker protection program has the most immediate and direct effect on injury and illness prevention.

¹ Effective management of worker safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related costs. To assist employers and employees in developing effective safety and health programs, OSHA published recommended Safety and Health Management Guidelines (*Federal Register* 54(18): 3908-3916, January 26, 1988). These voluntary guidelines apply to all places of employment covered by OSHA. The guidelines recommend specific actions, under each of these general elements, to achieve an effective safety and health program. A single free copy of the guidelines can be obtained from the OSHA Publications Office, U.S. Department of Labor, 200 Constitution Avenue, N.W., Room N3101, Washington DC 20210 by sending a self-addressed mail label with your request.

Basic Elements

OSHA believes that the following basic elements are essential for an effective workplace safety and health program:

- Management Commitment and Leadership;
- Employee Participation;
- Hazard Identification, Assessment, and Control;
- Training;
- Recordkeeping;
- Multi-employer Worksites;
- Accident and Incident Investigations; and
- Program Evaluation.

A review of safety and health programs that are effective in reducing workplace injuries and illnesses indicates that the basic elements listed above are present in some form. The elements are flexible and performance-based so that they can be adapted to workplace size, workplace conditions, and the nature of existing hazards.

Management Commitment and Leadership

Management commitment and leadership are widely accepted within the safety and health community or by safety and health professionals as preconditions for an effective safety and health program. An effective safety and health program is driven from the highest levels of the organization through all levels of management to front line supervisors and employees. Such leadership provides the motivating force and sets the tone for the entire program. Only management can assert and continually affirm that worker protection is a fundamental value of the organization, on par with other organizational functions such as production. In addition, only management can ensure that organizational resources are properly directed to activities that support the safety and health program.

OSHA urges employers to demonstrate leadership and commitment to an occupational safety and health program by:

- Establishing a clear occupational safety and health company policy;
- Defining the responsibilities of supervisory and non-supervisory personnel for safety and health at the worksite; and

- Providing appropriate authority and resources to carry out the program.

An effective safety policy for preventing and controlling workplace hazards should:

- Set forth the employer's goals for the safety and health program;
- Pledge to give the safety and health program priority with other business goals and activities;
- Establish what is expected of managers, supervisors, employees, and others to achieve program goals;
- Communicate to employees how they will benefit if safety and health program goals are met;
- Assign responsibilities for implementing the safety and health program;
- Provide authority and monetary and non-monetary resources to implement and maintain the safety and health program, including employee training, necessary equipment, and time allotted to perform safety and health duties;
- Establish accountability for safety and health (for example, make effective management of workplace safety and health part of job performance reviews);
- Communicate regularly with all employees about workplace safety and health issues, including individual discussions, posted information, written handouts, and safety meetings; and
- Receive employee recommendations, reports, and complaints about safety and health and respond promptly to them.

Employee Participation

The employer needs to provide opportunities for employees to participate in establishing, implementing, and evaluating a safety and health program. If it is to be effective, all employees need to become involved in the safety and health program. Employee participation is important because successfully identifying, preventing, and controlling hazards often requires a response that cuts across organizational units. Employees should be encouraged to participate in all aspects of the safety and health program, from developing and planning to implementing and evaluating. A fundamental aspect of employee participation is encouraging

employees to report work-related injuries, illnesses, and hazards and to recommend appropriate ways to address them. Prompt response to such reports is an essential way employers can show that they want employee input.

There are many different forms of employee participation. It can be individual and direct such as interviews, talking to workers during a workplace walkthrough, or establishing safety stewards. Other methods of employee participation include, but are not limited to, joint management/labor safety and health committees, management/labor accident review committees, management/labor safety surveys, management/labor accident investigation, and safety suggestion programs, employee safety training sessions, and safety meetings.

Safety and health committee members usually are volunteers selected by the union, by other employees, or by employers. The size and makeup of the committee is likely to vary, depending upon the size of the workplace and the nature of the operations and potential hazards. For example, at many unionized workplaces, employee safety committees work independent of management on various tasks. At other unionized workplaces, non-supervisory employees participate with management on a central workplace safety and health committee. At some workplaces, employee or joint committees are used for specific purposes, such as inspecting the workplace for hazards, investigating accidents and incidents, and training employees.

Successful employee participation relies on two things: knowledge and respect. Persons who participate in the program or have workplace safety and health responsibilities need training to carry out their responsibilities successfully. At unionized workplaces, this may mean respect between representatives of organizations. At non-union workplaces, there is respect between individuals and mutual respect among managers, supervisors, and workers.

Hazard Identification, Assessment, and Control

The employer must identify, assess, and control worksite hazards. This includes hazards that OSHA standards cover as well as other

recognized hazards that are causing or likely to cause death or physical harm to workers. To identify such worksite hazards, the employer should at least:

- Inspect the worksite,
- Review safety and health information, and
- Evaluate the seriousness of identified hazards that are not covered by OSHA standards.

After identifying and assessing worksite hazards, the employer needs to control them. The process of controlling hazards should include:

- Correcting unsafe or unhealthy conditions immediately,
- Providing interim employee protection where hazards cannot be corrected immediately, and
- Monitoring progress toward correction.

The hazard assessment and control process should address workplace hazards that cause or are likely to cause death, illness, or serious physical harm to employees. These hazards include those covered by OSHA standards, as well as chemical, physical, biological, and ergonomic hazards not covered by OSHA standards.

Hazard assessment and control needs to be a systematic process where the employer has established activities, procedures, or practices to implement or support the task. In addition, it means that the program activities are both ongoing and conducted on some routine basis that is appropriate to the particular workplace or the conditions and hazards.

There are many procedures employers can use to identify and evaluate serious workplace hazards:

- Reviewing records of injuries and illnesses. A review of OSHA-required workplace injury and illness logs can help employers learn what has caused problems in the past and how they can be avoided in the future. Small business employers who are not required to keep OSHA workplace injury and illness logs should review worker compensation claims.

- Reviewing other safety and health information. In addition to injury and illness records, the employer may have other information that indicates hazards may be present in the workplace. Such information may include reports from the employer's insurance company, "safety alerts" distributed by trade associations and other organizations of which the employer is a member, accident investigations, infirmity logs, employee safety and health complaints, material safety data sheets, and safety and health warnings from equipment manufacturers.
- Conducting workplace walkaround inspections. Looking at the workplace and recording conditions and actions that appear to be hazardous is another useful way to identify hazards. The walkaround should be comprehensive—from one end of the workplace to the other. In addition, following a work process from its beginning to end can help an employer identify problems and conditions that warrant closer examination.
- Using checklists to inspect the workplace. Checklists can be developed based upon common hazards that have occurred or are known to be present in particular operations or processes. Employers also can use a checklist developed by their insurance company or trade associations of which they are members.
- Performing job and associated hazard analyses. The process of dividing a job into its components or tasks can help the employer pinpoint factors that may be contributing to the problem. By identifying hazards associated with specific tasks, the employer may be more successful in finding ways to eliminate or control the hazards.
- Investigating accidents. These investigations can reveal the chain of events or unsafe acts or conditions that led up to the accident.
- Evaluating new equipment, materials, and processes. These can bring new hazards into the workplace, and the best time to address them is before they are introduced.

Assessing and controlling hazards are interrelated. Often the assessment process will reveal workplace hazards that need to be corrected. After serious hazards have been identified and analyzed, the employer needs to control them. In workplaces where the hazard assessment indicates that quite a few serious hazards are present or may take time to correct, the employer may need to set priorities for controlling the most serious hazards or ones that have already resulted in death, injury, or illness, and address them first. In such cases, employers need to set timetables for correcting these hazards and carefully track progress in achieving these fixes. Employees should be allowed and encouraged to participate in this process.

The best way to control hazards is in the design phase when the employer can make changes that will prevent the hazards from occurring. To do that engineers, maintenance, and procurement personnel should be encouraged to work together and with suppliers and manufacturers to anticipate and solve problems at the earliest stages. Smaller businesses should be encouraged to use the resources of trade associations to find new equipment, materials, and processes that will not expose employees to hazards.

Where hazards are present in the workplace, the employer needs to implement feasible controls to eliminate or reduce them. To control hazards, employers should follow the established hierarchy of controls that is a widely accepted, tiered intervention strategy for controlling workplace hazards. The three tiers, in order of preferred control methods, are as follows:

- Engineering and work practice controls. Engineering controls are physical changes to jobs to control exposure to hazards, such as changes to or redesign of work stations, equipment, materials, and processes. Work practices are safe work methods and correct operation of equipment.
- Administrative controls. Administrative controls are procedures and methods that significantly reduce daily exposure to hazards by altering the way in which work is performed. Administrative controls include job rotation, alternative tasks, redesign of work methods, and rest breaks.

- Personal protective equipment. These are devices worn or used while working to protect the employee from exposure to workplace hazards. Personal protective equipment includes, but is not limited to, respiratory protection, eye protection, hearing protection, gloves, steel-toed safety shoes, personal flotation devices, fall protection gear, and protective clothing.

Training

Employers should give all employees safety and health training for the types of jobs they perform. Training should include workplace hazard awareness and prevention. In addition, employees with safety and health responsibilities should receive special training to accomplish their responsibilities. Effective training is not “one size fits all;” therefore, the ways and mechanisms used to provide employee training are likely to vary significantly, depending upon factors such as:

- Workplace size,
- The types of operations being performed, and
- The nature of the workplace hazards.

The number of hours, frequency, or training format cannot always be specified. In fact, elaborate or formal training programs solely related to safety and health may not always be required. Some employer options include:

- Provide own organization training,
- Use contractors or organizations for training,
- Use formal classroom training every year,
- Use regular “tool box” meetings for safety and health information,
- Develop specific safety and health training, and
- Integrate safety and health issues into other employee training sessions.

Employees exposed to serious hazards must be trained so that they are able to assist in protecting themselves and other employees. While many OSHA standards do set forth training requirements, it

is important that employees exposed to serious hazards for which there are no standards or no training requirements still receive appropriate training. This is not to suggest that a safety and health program should duplicate or substitute for current OSHA training requirements; rather, safety and health program training is meant to generally educate employees about workplace hazard awareness and prevention.

Safety and health training should cover certain fundamentals:

- How to recognize job hazards,
- What the employer is doing to control hazards,
- Protective measures that the employee needs to follow to prevent or minimize exposure to hazards,
- Procedures to be followed in the event of an emergency,
- The employer's safety and health policy and program, and
- The employee's role in that program, including opportunities to participate.

For training to be effective, the educational levels, literacy, language skills, and comprehension of the employees being trained must be considered when developing and conducting training programs. Employees should also be offered the opportunity to ask questions and receive answers about safety and health issues.

In addition to general awareness training, it is important that both supervisory and non-supervisory employees with responsibility for implementing the safety and health program receive sufficient training to enable them to carry out those responsibilities. Such training should at least cover hazard identification methods, job safety analysis methods, control implementation and evaluation, and problem solving.

After initial safety and health training of employees, training should continue on both a routine and as-needed basis. In addition, training presentations and materials should be evaluated periodically to ensure that they are effective in providing employees with information necessary to protect them from injury and illness.

Recordkeeping

To demonstrate the effectiveness of the company's safety and health program, the employer should maintain safety and health records. Employers need to maintain sufficient records that allow them to know what hazards need to be controlled and to evaluate the effectiveness of the safety and health program in reducing deaths, injuries, and illnesses. For example, reviewing workplace injury experience over a period of time may reveal patterns of injury with common causes that can be addressed.

Using baseline data and yearly updates also will allow the employer to evaluate whether the safety and health program has been successful in addressing workplace hazards. Various factors determine what records an employer needs to maintain. For example, recordkeeping may be very informal or unnecessary for smaller workplaces or workplaces where few hazards are present. More specifically, in a small workplace the employer's notes from a workplace "walkaround" safety and health inspection may be the extent of the program records. On the other hand, larger workplaces or workplaces with safety and health committees may maintain more detailed records. Examples of some records typically maintained by employers are:

- First reports of injury,
- OSHA workplace injury and illness log,
- Employee training records,
- Safety and health inspection reports,
- Accident investigation reports,
- Accident analysis reports,
- Job safety analysis reports,
- Atmospheric monitoring data,
- Employee safety meeting minutes, and
- Safety committee meeting minutes.

These records should be maintained for as long as necessary, depending on their intended use. Some records are also required to be available for inspection, upon request, to employees, employee representatives, and the Assistant Secretary of Labor for OSHA.

Multiple Employer Worksites

Multiple employers often conduct work at a single maritime facility. The presence of multiple employers introduces additional problems and complexities in the communication and coordination of worker safety and health. There needs to be two-way communication between host and contract employers as well as reasonable allocation of workplace safety and health responsibilities among the employers that takes this added complexity into account. Generally, the host employer is in the best position to ensure that communication and coordination of workplace safety and health is taking place. This is because the host employer often controls the means and methods of work; however, contract employers also have a role in workplace safety and health.

Contract employers also may introduce hazards into the workplace that could endanger host employees. Host and contract employers, therefore, should initially exchange information on occupational hazards, safety rules, and emergency responses. Before starting any work, host employers, such as marine terminal operators or general contractors, should inform contract employers, or subcontractors, of any known safety and health hazard to which the contract employees may be exposed. The host employer should inform contract employers of applicable provisions in the host employer's safety and health program that apply to contract employees.

Contract employers should ensure that host employers are aware of hazards presented by contract work and how the hazards are being handled. Contract employers should instruct their employees about the hazards to which they may be exposed, as well as what the host employer is doing to correct the hazards. In addition, contract employers should notify host employers of any hazards they discover that were previously unidentified. In such cases, it is important that the contract employer advise the host employer so no persons at the workplace, regardless of which employer they work for, get injured or become ill.

Accident and Incident Investigation

The control component of the safety and health program is primarily a proactive measure; that is, aggressive implementation of this element may mean that the employer is able to identify and control all workplace hazards before any employee has been injured or becomes ill. The employer, however, should promptly investigate worksite fatalities, injuries, illnesses, and potentially hazardous incidents, or near misses. Although these types of investigations are reactive ways to improve workplace safety and health, they are an essential basic element of a safety and health program. This is especially true for a small workplace where there may not be significant injury and illness trend data to review.

A careful and thorough analysis will identify conditions and actions that contributed to or led up to any incident. After determining the causal factors, the employer can make corrections to prevent recurrence. The most successful investigations involve various persons working together within the organizational structure. In smaller workplaces, supervisors and employees working at the job in question can provide valuable insight. In larger workplaces, safety and health specialists, specially trained employees and supervisors, members of safety and health committees, engineers, and maintenance personnel are examples of persons who should be involved in evaluating accidents and “near misses.” Regardless of the size of the workplace, investigations should be promptly performed and the findings should be accompanied by appropriate corrections and program changes to prevent any future incidents.

Program Evaluation

The employer needs to periodically evaluate the safety and health program to ensure that it is effective in reducing and preventing workplace injuries and illnesses. The frequency of program evaluation is likely to vary based upon factors such as workplace size and conditions. However, OSHA recommends that employers evaluate their program shortly after implementing controls and at least annually thereafter. The employer should verify that elements,

practices, and procedures established under the safety and health program are appropriate to worksite conditions and are in compliance with OSHA requirements and that they are being followed. Where there are significant deficiencies, the program should be modified in a timely manner.

Although it is possible that the evaluation process is likely to differ among employers, the evaluation should demonstrate specific considerations:

- Assessing the need and appropriateness of existing goals and objectives, and
- Identifying areas where the program needs to be adjusted.

There are many different measures that employers can use to document program effectiveness. Some examples of commonly used measures include the following:

- Injury and illness statistics. This could include analyzing company as well as industrywide statistics on number of cases, incidence rates, and lost workdays.
- Safety and health inspection reports.
- Results of employee training.
- Company safety committee reports and recommendations. This could include reviewing the number of reports and response time.
- Insurance and workers' compensation data. This could include analyzing the number of claims, costs per claim, total medical costs, worker compensation experience modifiers, and insurance premiums.
- Total production and reject rates to detect productivity changes.

PART 1917 - MARINE TERMINALS

Subpart A—General Provisions

§1917.1— Scope and applicability.

The regulations of this part apply to employment within a marine terminal as defined in §1917.2, including the loading, unloading, movement, or other handling of cargo, ships' stores, or gear within the terminal or into or out of any land carrier, holding or consolidation area, any other activity within and associated with the overall operation and functions of the terminal, such as the use and routine maintenance of facilities and equipment. All cargo transfer accomplished with the use of shore-based material handling devices shall be regulated by this part.

(1) The provisions of this Part 1917 do not apply to the following:

(i) Facilities used solely for the bulk storage, handling and transfer of flammable, non-flammable, and combustible liquids and gases.

(ii) Facilities subject to the regulations of the Office of Pipeline Safety Regulation of the Materials Transportation Bureau, Department of Transportation, to the extent such regulations apply.

(iii) Fully automated bulk coal handling facilities contiguous to electrical power generating plants.

(2) Part 1910 of this chapter does not apply to marine terminals except for the following provisions:

(i) *Abrasive blasting.* Subpart G, §1910.94(a);

(ii) *Access to employee exposure and medical records.* Subpart Z, §1910.1020;

(iii) *Commercial diving operations.* Subpart T of part 1910;

- (iv) *Electrical*. Subpart S of part 1910;
- (v) *Grain handling facilities*. Subpart R, §1910.272;
- (vi) *Hazard communication*. Subpart Z, §1910.1200;
- (vii) *Ionizing radiation*. Subpart Z, §1910.1096;
- (viii) *Noise*. Subpart G, §1910.95;
- (ix) *Nonionizing radiation*. Subpart G, §1910.97;
- (x) *Respiratory protection*. Subpart I, §1910.134;
- (xi) *Safety requirements for scaffolding*. Subpart D, §1910.28;
- (xii) *Servicing multi-piece and single piece rim wheels*. Subpart N, §1910.177;
- (xiii) *Toxic and hazardous substances*. Subpart Z applies to marine cargo handling activities except for the following:
 - (A) When a substance or cargo is contained within a sealed, intact means of packaging or containment complying with Department of Transportation or International Maritime Organization requirements;¹
 - (B) Bloodborne pathogens, §1910.1030;
 - (C) Carbon monoxide, §1910.1000 (See §1917.24(a)); and
 - (D) Hydrogen sulfide, §1910.1000 (See §1917.73(a)(2)); and
- (xiv) Powered industrial truck operator training, Subpart N, §1910.178(l).

¹ The International Maritime Organization publishes the International Maritime Dangerous Goods Code to aid compliance with the international legal requirements of the International Convention for the Safety of Life at Sea, 1960.

(xiv) Powered industrial truck operator training, Subpart N, §1910.178(l).

§1917.2—Definitions.

Apron means that open portion of a marine terminal immediately adjacent to a vessel berth and used in the direct transfer of cargo between the terminal and vessel.

Authorized, in reference to an employee's assignment, means selected by the employer for that purpose.

Cargo door (transit shed door) means a door designed to permit transfer of cargo to and from a marine terminal structure.

Cargo packaging means any method of containment for shipment, including cases, cartons, crates and sacks, but excluding large units such as intermodal containers, vans or similar devices.

Confined space means a space having all of the following characteristics:

- (1) Small size;
- (2) Severely limited natural ventilation;
- (3) Capability to accumulate or contain a hazardous atmosphere;
- (4) Exits that are not readily accessible; and
- (5) A design not meant for continuous human occupancy.

Examples of confined spaces are intermodal tank containers, bailwater tanks, and portable tanks.

Conveyor means a device designed exclusively for transporting bulk materials, packages, or objects in a predetermined path and having fixed or selective points of loading or discharge.

Danger zone means any place in or about a machine or piece of equipment where an employee may be struck by or caught between moving parts, caught between moving and stationary objects or parts of the machine, caught between the material and a moving part of the machine, burned by hot surfaces, or exposed to electric shock. Examples of danger zones are nip and shear points, shear lines, drive mechanisms, and areas beneath counterweights.

Designated person means a person who possesses specialized abilities in a specific area and is assigned by the employer to perform a specific task in that area.

Dock means a wharf or pier forming all or part of a waterfront facility, including marginal or quayside berthing facilities; not to be confused with “loading dock” as at a transit shed or container freight station, or with the body of water between piers or wharves.

Dockboards (car and bridge plates) mean devices for spanning short distances between rail cars or highway vehicles and loading platforms that do not expose employees to falls greater than 4 ft. (1.22 meters).

Enclosed space means an indoor space other than a confined space, that may contain or accumulate a hazardous atmosphere due to inadequate natural ventilation. Examples of enclosed spaces are trailers, railcars, and storage rooms.

Examination, as applied to material handling devices required by this part to be certificated, means a comprehensive survey consisting of the criteria outlined in 29 CFR 1919.71(d) as applicable to the type of gear or device. The examination is supplemented by a unit proof test in the case of a quadrennial survey.

Flammable atmosphere means an atmosphere containing more than 10 percent of the lower flammable limit of a flammable or combustible vapor or dust mixed with air.

Front-end attachments. (1) As applied to power-operated industrial trucks, means the various devices, such as roll clamps, rotating and side carriages, magnets, rams, crane arms or booms, load stabilizers, scoops, buckets, and dumping bins, attached to the load end for handling lifts as single or multiple units.

(2) As applied to cranes, means various attachments applied to the basic machine for the performance of functions such as lifting, clamshell, or magnet services.

Fumigant is a substance or mixture of substances, used to kill pests or prevent infestation, which is a gas or is rapidly or progressively transformed to the gaseous state, even though some nongaseous or particulate matter may remain and be dispersed in the treatment space.

Hazardous cargo, material, substance or atmosphere means:

(1) Any substance listed in 29 CFR Part 1910, Subpart Z;

(2) Any material in the Hazardous Materials Table and Hazardous Materials Communications Regulations of the Department of Transportation, 49 CFR Part 172;

(3) Any article not properly described by a name in the Hazardous Materials Table and Hazardous Materials Communications Regulations of the Department of Transportation, 49 CFR Part 172 but which is properly classified under the definition of those categories of dangerous articles given in 49 CFR 173; or

(4) Any atmosphere with an oxygen content of less than, 19.5%.

House falls means spans and supporting members, winches, blocks, and standing and running rigging forming part of a marine terminal and used with a vessel's cargo gear to load or unload by means of married falls.

Inspection, as applied to material handling devices required by this part to be certificated, means a complete visual examination of all visible parts of the device.

Intermodal container means a reusable cargo container of a rigid construction and rectangular configuration; fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another; so designed to be readily filled and emptied; intended to contain one or more articles of cargo or bulk commodities for transportation by water and one or more other transport modes. The term includes completely enclosed units, open top units, fractional height units, units incorporating liquid or gas tanks and other variations fitting into the container system. It does not include cylinders, drums, crates, cases, cartons, packages, sacks, unitized loads, or any other form of packaging.

Loose gear means removable and replaceable components of equipment or devices which may be used with or as a part of assembled material handling units for purposes such as making connections, changing line direction and multiplying mechanical advantage. Examples are shackles and snatch blocks.

Marine terminal means wharves, bulkheads, quays, piers, docks, and other berthing locations and adjacent storage or adjacent areas and structures associated with the primary movement of cargo or materials from vessel to shore or shore to vessel including structures which are devoted to receiving, handling, holding, consolidating, and loading or delivery of waterborne shipments or passengers, including areas devoted to the maintenance of the terminal or equipment. The term does not include production or manufacturing areas nor does the term include storage facilities directly associated with those production or manufacturing areas.

Ramps mean other flat-surface devices for passage between levels and across openings not covered under *Dockboards*.

§1917.3—Incorporation by reference.

(a)(1) The standards of agencies of the U.S. Government, and organizations which are not agencies of the U.S. Government which are incorporated by reference in this part, have the same force and effect as other standards in this part. Only the mandatory provisions (i.e. provisions containing the word “shall” or other

mandatory language) of standards incorporated by reference are adopted as standards under the *Occupational Safety and Health Act*.

(2) Any changes in the standards incorporated by reference in this part and an official historic file of such changes are available for inspection at the national office of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, Washington, DC 20210.

(3) The materials listed in paragraph (b) of this section are incorporated by reference in the corresponding sections noted as they exist on the date of the approval, and a notice of any change in these materials will be published in the *Federal Register*. These incorporations by reference (IBRs) were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and in 1 CFR part 51.

(4) Copies of the following standards that are issued by the respective private standards organizations may be obtained from the issuing organizations. The materials are available for purchase at the corresponding addresses of the private standards organizations noted in paragraph (b) of this section. In addition, all are available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington DC, and through the OSHA Docket Office, Room N2625, U.S. Department of Labor, 200 Constitution Ave., Washington, DC 20210, or any of OSHA's regional offices.

(b) The following material is available for purchase from the American National Standards Institute (ANSI), 11 West 42nd St., New York, NY 10036:

(1) ANSI A14.1-1990, Safety Requirements for Portable Wood Ladders; IBR approved for 1917.119(c).

(2) ANSI A14.2-1990, Safety Requirements for Portable Metal Ladders; IBR approved for 1917.119(c).

(3) ANSI A14.5-1992, Safety Requirements for Portable Reinforced Plastic Ladders; IBR approved for 1917.119(c).

(4) ANSI Z-87.1-1989, Practice for Occupational and Educational Eye and Face Protection, IBR approved for 1917.91(a)(1).

(5) ANSI Z-89.1-1986, Personnel Protection-Protective Headwear for Industrial Workers-Requirements; IBR approved for 1917.93(b).

(6) ANSI Z-41-1991, American National Standard for Personal Protection-Protective Footwear; IBR approved for 1917.94(b).

(7) ASME B56.1, 1959, Safety Code for Powered Industrial Trucks pages 8 and 13; IBR approved for Sec. 1917.50(j)(1).

§1917.4—OMB Control numbers under the Paperwork Reduction Act.

The following list identifies the 29 CFR citations for sections or paragraphs in this part that contain collection of information requirement approved by the Office of Management and Budget (OMB). The list also provides the control number assigned by OMB to each approved requirement; control number 1218-0196 expires on May 31, 2002 and control number 1218-0003 expires on July 31, 2001. The list follows:

29 CFR citation	OMB control number	29 CFR citation	OMB control number
1917.17(n)	1218-0196	1917.30(a)(1)	1218-0196
1917.17(o)	1218-0196	1917.30(a)(5)(iii)	1218-0196
1917.23(b)(1)	1218-0196	1917.42(b)(1)	1218-0196
1917.23(b)(2)	1218-0196	1917.42(b)(4)	1218-0196
1917.23(d)(4)	1218-0196	1917.42(c)(1)	1218-0196
1917.24(b)	1218-0196	1917.42(d)(1)	1218-0196
1917.24(d)	1218-0196	1917.42(g)(3)	1218-0003
1917.25(a)	1218-0196	1917.42(h)(1)	1218-0196
1917.25(b)	1218-0196	1917.42(h)(4)	1218-0003
1917.25(c)	1218-0196	1917.42(h)(5)	1218-0196
1917.25(f)	1218-0196	1917.44(e)	1218-0196
1917.26(d)(7)	1218-0196	1917.44(h)	1218-0196

29 CFR citation	OMB control number	29 CFR citation	OMB control number
1917.45(f)(1)(i)	1218-0196	1917.71(f)(4)	1218-0196
1917.45(f)(4)(iv)	1218-0196	1917.111(b)	1218-0196
1917.45(f)(6)	1218-0196	1917.113	1218-0196
1917.45(g)(2)	1218-0196	1917.115(c)	1218-0196
1917.45(g)(3)(iii)	1218-0196	1917.116(e)	1218-0196
1917.45(g)(8)	1218-0196	1917.116(g)	1218-0196
1917.45(k)(1)	1218-0196	1917.117(a)	1218-0196
1917.45(k)(4)	1218-0196	1917.117(b)	1218-0196
1917.46(a)(1)(v)	1218-0196	1917.117(d)	1218-0196
1917.50(c)(1)	1218-0003	1917.117(e)	1218-0196
1917.50(c)(3)	1218-0003	1917.117(f)	1218-0196
1917.50(c)(4)(i)	1218-0003	1917.117(l)	1218-0196
1917.50(c)(5)(ii)	1218-0003	1917.118(e)(4)(i)	1218-0196
1917.50(c)(5)(iii)	1218-0003	1917.119(e)	1218-0196
1917.50(e)	1218-0003	1917.122(a)	1218-0196
1917.50(g)(1)	1218-0003	1917.122(b)	1218-0196
1917.50(h)	1218-0003	1917.128(b)(1)-(b)(4)	1218-0196
1917.71(a)	1218-0196	1917.151(e)(5)	1218-0196
1917.71(b)(2)(i)	1218-0196	1917.152(d)(a)(v)	1218-0196
1917.71(b)(2)(ii)	1218-0196	1917.152(d)(a)(vi)	1218-0196
1917.71(b)(6)(ii)	1218-0196		

Subpart B—Marine Terminal Operations

§1917.11—Housekeeping.

(a) Active work areas shall be kept free of equipment and materials not in use, and clear of debris, projecting nails, strapping, and other sharp objects not necessary for the work in progress.

(b) Hatch beams, covers, and pontoons placed in terminal working areas shall be stowed in stable piles with beams secured against tipping or falling. Alternatively, beams may be laid on their sides. When beams and pontoons are stowed in tiers more than one high, dunnage or other suitable material shall be used under and between tiers.

(c) Cargo and material shall not obstruct access to vessels, cranes, vehicles, or buildings. Means of access and egress within the buildings shall be similarly unobstructed.

(d) Dunnage, lumber, or shoring material in which there are visibly protruding nails shall be removed from the immediate work area or if left in the area, the nails shall be rendered harmless.

§1917.12—Slippery conditions.

The employer shall eliminate, to the extent possible, conditions causing slippery working and walking surfaces in immediate work areas used by employees.

§1917.13—Slinging.

(a) Drafts shall be safely slung before being hoisted. Loose dunnage or debris hanging or protruding from loads shall be removed.

(b) Bales of cotton, wool, cork, wood pulp, gunny bags, or similar articles shall be hoisted only by straps strong enough to support the weight of the bale. At least two hooks, each in a separate strap, shall be used.

(c) Unitized loads bound by bands or straps may be hoisted by the banding or strapping only if the banding or strapping is suitable for hoisting and is strong enough to support the weight of the load.

(d) Additional means of hoisting shall be employed to ensure safe lifting of unitized loads having damaged banding or strapping.

(e) Case hooks shall be used only with cases designed to be hoisted by these hooks.

(f) Loads requiring continuous manual guidance during handling shall be guided by guide ropes (tag lines) that are long enough to control the load.

(g) Intermodal containers shall be handled in accordance with 1917.71(f).

(h) The employer shall require employees to stay clear of the area beneath overhead drafts or descending lifting gear.

(i) Employees shall not be permitted to ride the hook or the load.

§1917.14—Stacking of cargo and pallets.

Cargo, pallets, and other material stored in tiers shall be stacked in such a manner as to provide stability against sliding and collapse.

§1917.15—Coopering.

Repair and reconditioning of damaged or leaking cargo packaging (coopering) shall be performed so as not to endanger employees.

§1917.16—Line handling (See also §1917.95(b)).

(a) In order to provide safe access for handling lines while mooring and unmooring vessels, cargo or material shall not be stowed or vehicles placed where they obstruct the work surface to be used.

(b) When stringpiece or apron width is insufficient for safe footing, grab lines or rails shall be installed on the sides of permanent structures. (“Stringpiece” means a narrow walkway between the water edge of a berth and a shed or other structure.)

§1917.17—Railroad facilities.

(a) Work shall be performed in railcars only if floors of the railcars are in visibly safe condition for the work activity being conducted and equipment being used.

(b) A route shall be established to allow employees to pass to and from places of employment without passing under, over or through railcars, or between cars less than 10 feet (3 m) apart on the same track.

- (c)** The employer shall direct that no employees remain in railcars after work is concluded.
- (d)** Railcars shall be chocked or otherwise prevented from moving:
- (1)** While dockboards or carplates are in position; or
 - (2)** While employees are working within, on, or under the railcars or near the tracks at the ends of the cars.
- (e)** When employees are working in, on, or under a railcar, positive means shall be taken to protect them from exposure to impact from moving railcars.
- (f)** Before cars are moved, unsecured and overhanging stakes, wire straps, banding and similar objects shall be removed or placed so as not to create hazards.
- (g)** The employer shall institute all necessary controls during railcar movement to safeguard personnel. If winches or capstans are employed for movement, employees shall stand clear of the hauling rope and shall not stand between the rope and the cars.
- (h)** Before being opened fully, doors shall be opened slightly to ensure that the load has not shifted during transit. Special precautions shall be taken if the doors being opened are visibly damaged.
- (i)** If powered industrial trucks are used to open railcar doors, the trucks or the railcar doors shall be equipped with door opening attachments. Employees shall stand clear of the railcar doors while they are being opened and closed.
- (j)** Only railcar door openers or powered industrial trucks equipped with door opening attachments shall be used to open jammed doors.
- (k)** Employees shall not remain in or on gondolas or flat cars when drafts that create overhead, caught-in, caught-between, or struck-

by hazards are being landed in or on the railcar; end gates, if raised, shall be secured.

(l) Operators of railcar dumps shall have an unrestricted view of dumping operations and shall have emergency means of stopping movement.

(m) Recessed railroad switches shall be enclosed to provide a level surface.

(n) Warning signs shall be posted where doorways open onto tracks, at blind corners and at similar places where vision may be restricted.

(o) Warning signs shall be posted if insufficient clearance for personnel exists between railcars and structures.

§1917.18—Log handling.

(a) The employer shall ensure that structures (bunks) used to contain logs have rounded corners and rounded structural parts to avoid sling damage.

(b) Two or more binders or equivalently safe means of containment shall remain on logging trucks and railcars to secure logs during movement of the truck or car within the terminal. During unloading, logs shall be prevented from moving while binders are being removed.

(c) Logs shall be hoisted by two slings or by other gear designed for safe hoisting.

(d) Logs placed adjacent to vehicle curbs on the dock shall not be more than one tier high unless placed in bunks or so stacked as not to roll or otherwise create a hazard to employees.

(e) Before logs are slung up from the dock, they shall be stably supported to prevent spreading and to allow passage of slings beneath the load. When bunks or similar retaining devices are used,

no log shall be higher than the stanchions or retaining members of the device.

§1917.19—Movement of barges and railcars.

Barges and railcars shall not be moved by cargo runners (running rigging) from vessel cargo booms, cranes, or other equipment not suitable for the purpose.

§1917.20—Interference with communications.

Cargo handling operations shall not be carried on when noise-producing maintenance, construction, or repair work interferes with the communication of warnings or instructions.

§1917.21—Open fires.

Open fires and fires in drums or similar containers are prohibited.

§1917.22—Hazardous cargo² (See §1917.2(p)).

(a) Before cargo handling operations begin, the employer shall ascertain whether any hazardous cargo is to be handled and shall determine the nature of the hazard. The employer shall inform employees of the nature of any hazard and any special precautions to be taken to prevent employee exposure, and shall instruct employees to notify him of any leaks or spills.

(b) All hazardous cargo shall be slung and secured so that neither the draft nor individual packages can fall as a result of tipping the draft or slacking of the supporting gear.

(c) If hazardous cargo is spilled or if its packaging leaks, employees shall be removed from the affected area until the employer has ascertained the specific hazards, provided any equipment, clothing

²The Department of Transportation and the United States Coast Guard apply requirements related to handling, storing, and transportation of hazardous cargo (See 33 CFR part 126; 46 CFR; 49 CFR).

and ventilation, and fire protection equipment necessary to eliminate or protect against the hazard, and has instructed cleanup employees in a safe method of cleaning up and disposing of a spill and handling and disposing of leaking containers. Actual cleanup or disposal work shall be conducted under the supervision of a designated person.

§1917.23—Hazardous atmospheres and substances (See also §1917.2 Hazardous cargo, material, substance, or atmosphere).

(a) *Purpose and scope.* This section covers areas in which the employer is aware that a hazardous atmosphere or substance may exist, except where one or more of the following sections apply: §1917.22 Hazardous cargo; §1917.24 Carbon monoxide; §1917.25 Fumigants, pesticides, insecticides and hazardous preservatives; §1917.73 Terminal facilities handling menhaden and similar species of fish; §1917.152 Welding, cutting, and heating (hot work); and §1917.153 Spray painting.

(b) *Determination of hazard.***(1)** When the employer is aware that a room, building, vehicle, railcar, or other space contains or has contained a hazardous atmosphere, a designated and appropriately equipped person shall test the atmosphere before employee entry to determine whether a hazardous atmosphere exists.

(2) Records of results of any tests required by this section shall be maintained for at least thirty (30) days.

(c) *Testing during ventilation.* When mechanical ventilation is used to maintain a safe atmosphere, tests shall be made by a designated person to ensure that the atmosphere is not hazardous.

(d) *Entry into hazardous atmospheres.* Only designated persons shall enter hazardous atmospheres, in which case the following shall apply:

(1) Persons entering a space containing a hazardous atmosphere shall be protected by respiratory and emergency protective equipment meeting the requirements of Subpart E of this part;

(2) Persons entering a space containing a hazardous atmosphere shall be instructed in the nature of the hazard, precautions to be taken, and the use of protective and emergency equipment. Standby observers, similarly equipped and instructed, shall continuously monitor the activity of employees within such space;

(3) Except for emergency or rescue operations, employees shall not enter into any atmosphere which has been identified as flammable or oxygen deficient (less than 19.5% oxygen). Persons who may be required to enter flammable or oxygen deficient atmospheres in emergency operations shall be instructed in the dangers attendant to those atmospheres and instructed in the use of self-contained breathing apparatus, which shall be utilized.

(4) To prevent inadvertent employee entry into spaces that have been identified as having hazardous, flammable or oxygen deficient atmospheres, appropriate warning signs or equivalent means shall be posted at all means of access to those spaces.

(e) When the packaging of asbestos cargo leaks, spillage shall be cleaned up by designated employees protected from the harmful effects of asbestos as required by §1910.1001 of this chapter.

§1917.24—Carbon monoxide.

(a) *Exposure limits.* The carbon monoxide content of the atmosphere in a room, building, vehicle, railcar, or any enclosed space shall be maintained at not more than 50 parts per million (ppm) (0.005%) as an 8-hour average area level and employees shall be removed from the enclosed space if the carbon monoxide concentration exceeds a ceiling of 100 ppm (0.01%).

(b) *Testing.* Tests to determine carbon monoxide concentration shall be made when necessary to ensure that employee exposure does not exceed the limits specified in paragraph (a) of this section.

(c) *Instrumentation.* Tests for carbon monoxide concentration shall be made by designated persons using gas detector tube units certified by NIOSH under 30 CFR Part 11 or other measuring instruments whose accuracy is as great or greater.

(d) *Records.* A record of the date, time, location, and results of carbon monoxide tests shall be available for at least thirty (30) days.

§1917.25—Fumigants, pesticides, insecticides, and hazardous preservatives (See also §1917.2, Hazardous cargo, material, substance or atmosphere).

(a) At any time that the concentration in any space reaches the level specified as hazardous by the fumigant manufacturer or by Table Z-1 of 29 CFR 1910.1000, whichever is lower, all employees shall be removed from the space and shall not be permitted to re-enter until such time as tests demonstrate that the atmosphere is safe.

(b) Tests to determine the atmospheric concentration of chemicals used to treat cargo shall be:

(1) Appropriate for the hazard involved;

(2) Conducted by designated persons; and

(3) Performed at the intervals necessary to ensure that employee exposure does not exceed the permissible exposure limit for the chemical involved.

(c) Results of any tests shall be available for at least 30 days. Such records may be entered on any retrievable medium and shall be available for inspection.

(d) Chemicals shall only be applied to cargoes by designated persons.

(e) Only designated persons shall enter hazardous atmospheres, in which case the following provisions apply:

- (1) Persons entering a space containing a hazardous atmosphere shall be protected by respiratory and emergency protective equipment meeting the requirements of Subpart E of this part; and
- (2) Persons entering a space containing a hazardous atmosphere shall be instructed in the nature of the hazard, precautions to be taken, and the use of protective and emergency equipment. Standby observers, similarly equipped and instructed, shall continuously monitor the activity of employees within such a space.
- (f) Signs shall be clearly posted where fumigants, pesticides, or hazardous preservatives have created a hazardous atmosphere. These signs shall note the danger, identify specific chemical hazards, and give appropriate information and precautions including instructions for the emergency treatment of employees affected by any chemical in use.
- (g) In the case of containerized shipments of fumigated tobacco, the contents of the container shall be aerated by opening the container doors for a period of 48 hours after the completion of fumigation and prior to loading. When tobacco is within shipping cases having polyethylene or similar bag liners, the aeration period shall be 72 hours. The employer shall obtain a written warranty from the fumigation facility stating that the appropriate aeration period has been met.

§1917.26—First aid and life saving facilities.

- (a) Employers shall instruct employees to report every injury, regardless of severity, to the employer.
- (b) A first aid kit shall be available at the terminal, and at least one person holding a valid first aid certificate shall be at the terminal when work is in progress.
- (c) *First aid kit.* First aid kits shall be weatherproof and shall contain individual sealed packages for each item that must be kept sterile. The contents of each kit shall be determined by a person certified in first aid and cognizant of the hazards found in marine cargo handling operations. The contents shall be checked at intervals that allow prompt replacement of expended items.

(d) Stretchers. (1) There shall be available for each vessel being worked one Stokes basket stretcher, or its equivalent, permanently equipped with bridles for attaching to the hoisting gear.

(2) Stretchers shall be kept close to vessels and shall be positioned to avoid damage to the stretcher.

(3) A blanket or other suitable covering shall be available.

(4) Stretchers shall have at least four sets of effective patient restraints in operable condition.

(5) Lifting bridles shall be of adequate strength, capable of lifting 1,000 pounds (454 kg) with a safety factor of five, and shall be maintained in operable condition. Lifting bridles shall be provided for making vertical patient lifts at container berths. Stretchers for vertical lifts shall have foot plates.

(6) Stretchers shall be maintained in operable condition. Struts and braces shall be inspected for damage. Wire mesh shall be secured and have no burrs. Damaged stretchers shall not be used until repaired.

(7) Stretchers in permanent locations shall be mounted to prevent damage and shall be protected from the elements if located out-of-doors. If concealed from view, closures shall be marked to indicate the location of the life saving equipment.

(e) Telephone or equivalent means of communication shall be readily available.

(f) A U.S. Coast Guard approved 30-inch (76.2 cm) life ring, with at least 90 feet (27.43 m) of line attached, shall be available at readily accessible points at each waterside work area where the employees' work exposes them to the hazard of drowning. Employees working on any bridge or structure leading to a detached vessel berthing installation shall wear U.S. Coast Guard approved personal flotation devices except where protected by railings, nets, or safety belts and lifelines. A readily available

portable or permanent ladder giving access to the water shall also be provided within 200 feet (61 m) of such work areas.

§1917.27—Personnel.

(a) *Qualifications of machinery operators.* (1) Only those employees determined by the employer to be competent by reason of training or experience, and who understand the signs, notices, and operating instructions and are familiar with the signal code in use shall be permitted to operate a crane, winch, or other power operated cargo handling apparatus, or any power operated vehicle, or give signals to the operator of any hoisting apparatus.

EXCEPTION: Employees being trained and supervised by a designated person may operate such machinery and give signals to operators during training.

(2) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments that may suddenly incapacitate the employee, shall be permitted to operate a crane, winch or other power-operated cargo handling apparatus or a power-operated vehicle.

NOTE TO PARAGRAPH (a)(2): OSHA is defining suddenly incapacitating medical ailments consistent with the Americans with Disabilities Act (ADA), 42 U.S.C. 12101 (1990). Therefore, employers who act in accordance with the employment provisions (Title I) of the ADA (42 U.S.C. 12111-12117), the regulations implementing Title I (29 CFR part 1630), and the Technical Assistance Manual for Title I issued by the Equal Employment Opportunity Commission (Publication number: EEOC—M1A), will be considered as being in compliance with this paragraph.

(b) *Supervisory accident prevention proficiency.* (1) After October 3, 1985 immediate supervisors of cargo-handling operations of more than five persons, shall satisfactorily complete a course in accident prevention. Employees newly assigned to supervisory duties after that date shall be required to meet the provisions of this paragraph within 90 days of such assignment.

(2) The course shall consist of instruction suited to the particular operations involved.³

§1917.28—Hazard communication (See also §1917.1(a)(2)(vi)).

§1917.29—Retention of DOT markings, placards, and labels.

(a) Any employer who receives a package of hazardous material which is required to be marked, labeled, or placarded in accordance with the U. S. Department of Transportation's Hazardous Materials Regulations (49 CFR Parts 171 through 180) shall retain those markings, labels and placards on the package until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards.

(b) Any employer who receives a freight container, rail freight car, motor vehicle, or transport vehicle that is required to be marked or placarded in accordance with the Hazardous Materials Regulations shall retain those markings and placards on the freight container, rail freight car, motor vehicle, or transport vehicle until the hazardous materials which require the marking or placarding are sufficiently removed to prevent any potential hazards.

(c) Markings, placards and labels shall be maintained in a manner that ensures that they are readily visible.

(d) For non-bulk packages which will not be reshipped, the provisions of this section are met if a label or other acceptable marking is affixed in accordance with the Hazard Communication Standard (29 CFR 1910.1200).

(e) For the purposes of this section, the term "hazardous material" and any other terms not defined in this section have the same definition as in the Hazardous Materials Regulations (49 CFR Parts 171 through 180).

³The following are recommended topics: (i) Safety responsibility and authority; (ii) elements of accident prevention; (iii) attitudes, leadership, and motivation; (iv) hazards of longshoring, including peculiar local circumstances; (v) hazard identification and elimination; (vi) applicable regulations; and (vii) accident investigations.

§1917.30—Emergency action plans.

(a) *Emergency action plans. (1) Scope and application.* This paragraph (a) requires all employers to develop and implement an emergency action plan^{3a}. The emergency action plan shall be in writing (except as provided in the last sentence of paragraph (a)(5)(iv) of this section) and shall cover those designated actions employers and employees must take to ensure employee safety from fire and other emergencies.

(2) *Elements.* The following elements, at a minimum, shall be included in the plan:

(i) Emergency escape procedures and emergency escape route assignments;

(ii) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;

(iii) Procedures to account for all employees after emergency evacuation has been completed;

(iv) Rescue and medical duties for those employees who are to perform them;

(v) The preferred means of reporting fires and other emergencies; and

(vi) Names or regular job titles of persons or departments that can be contacted for further information or explanation of duties under the plan.

(3) *Alarm system.* The employer shall establish an employee alarm system that provides warning for necessary emergency action and for reaction time for safe escape of employees from the workplace or the immediate work area.

^{3a} When an employer directs his employees to respond to an emergency that is beyond the scope of the Emergency Action Plan developed in accordance with this section then §1910.120(q) shall apply.

(4) Evacuation. The employer shall establish the types of evacuation to be used in emergency circumstances.

(5) Training.(i) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(ii) The employer shall review the plan with each employee covered by the plan at the following times:

(A) Initially when the plan is developed;

(B) Whenever the employee's responsibilities or designated actions under the plan change; and,

(C) Whenever the plan is changed.

(iii) The employer shall review with each employee upon initial assignment those parts of the plan that the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and be made available for employee review.

(iv) Employers with 10 or fewer employees may communicate the plan orally to employees and need not maintain a written plan.

Subpart C—Cargo Handling Gear and Equipment

§1917.41—House falls.

(a) Span beams shall be secured to prevent accidental dislodgment.

(b) A safe means of access shall be provided for employees working with house fall blocks.

(c) Designated employees shall inspect chains, links, shackles, swivels, blocks, and other loose gear used in house fall operations before each day's use. Defective gear shall not be used.

§1917.42—Miscellaneous auxiliary gear.

(a) Routine inspection. (1) At the completion of each use, loose gear such as slings, chains, bridles, blocks, and hooks shall be so placed as to avoid damage to the gear. Loose gear shall be inspected and any defects corrected before reuse.

(2) All loose gear shall be inspected by the employer or his authorized representative before each use and, when necessary, at intervals during its use, to ensure that it is safe. Any gear which is found upon such inspection to be visibly unsafe shall not be used until it is made safe.

(3) Defective gear shall not be used. Distorted hooks, shackles, or similar gear shall be discarded.

(b) Wire rope and wire rope slings. (1) The employer shall ascertain and adhere to the manufacturer's recommended ratings for wire rope and wire rope slings and shall have such ratings available for inspection. When the manufacturer is unable to supply such ratings, the employer shall use the tables for wire rope and wire rope slings found in American National Safety Standard for Slings, ANSI B30.9-1971. A design safety factor of at least five shall be maintained for the common sizes of running wire used as falls, in purchases, or in such uses as light load slings. Wire rope with a safety factor of less than five may be used only:

(i) In specialized equipment, such as but not limited to cranes, designed to be used with lesser wire rope safety factors;

(ii) In accordance with design factors standing rigging applications; or

(iii) For heavy lifts or other purposes for which a safety factor of five is impracticable and for which the employer can demonstrate that equivalent safety is ensured.

(2) Wire rope or wire rope slings having any of the following conditions shall not be used:

- (i)** Ten randomly distributed broken wires in one rope lay or three or more broken wires in one strand in one rope lay;
 - (ii)** Kinking, crushing, bird caging, or other damage resulting in distortion of the wire rope structure;
 - (iii)** Evidence of heat damage;
 - (iv)** Excessive wear or corrosion, deformation or other defect in the wire or attachments, including cracks in attachments;
 - (v)** Any indication of strand or wire slippage in end attachments; or
 - (vi)** More than one broken wire in the close vicinity of a socket or swaged fitting.
- (3)** Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Coverings shall be removable so that splices can be examined. Means used to cover or blunt ends shall not damage the wire.
- (4)** Where wire rope clips are used to form eyes, the employer shall adhere to the manufacturer's recommendations, which shall be made available for inspection. If "U" bolt clips are used and the manufacturer's recommendations are not available, Table C-1 shall be used to determine the number and spacing of the clips. "U" bolts shall be applied with the "U" section in contact with the dead end of the rope.

TABLE C-1 - NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel,rope diameter	Minimum number of Clips		Minimum spacing
	Drop forged	Other material	inches/ (cm)
1/2 or less (1.3)	3	4	3 (7.6)
5/8 (1.6)	3	4	3 3/4 (9.5)
3/4 (1.9)	4	5	4 1/2 (11.4)
7/8 (2.2)	4	5	5 1/4 (13.3)
1 (2.5)	5	7	6 (15.2)
1 1/8 (2.9)	6	7	6 3/4 (17.1)
1 1/4 (3.2)	6	8	7 1/2 (19.1)
1 3/8 (3.5)	7	8	8 1/4 (21.0)
1 1/2 (3.8)	7	9	9 (22.9)

(5) Wire rope shall not be secured by knots.

(6) Eyes in wire rope bridles, slings, bull wires, or in single parts used for hoisting shall not be formed by wire rope clips or knots.

(7) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections which are shown to be equivalently safe may be used.

(8) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in bulling cargo, shall consist of one continuous piece without knot or splice.

(c) Natural fiber rope. (1) The employer shall ascertain the manufacturers' ratings for the specific natural fiber rope used and have such ratings available for inspection. The manufacturers' ratings shall be adhered to and a minimum design safety factor of five maintained.

(2) Eye splices shall consist of at least three full tucks. Short splices consist of at least six full tucks, three on each side of the center line.

(d) *Synthetic rope.* (1) The employer shall adhere to the manufacturers' ratings and use recommendations for the specific synthetic fiber rope used and shall make such ratings available for inspection.

(2)(i) Unless otherwise recommended by the manufacturer, when synthetic fiber ropes are substituted for fiber ropes of less than three inches (7.62 cm) in circumference, the substitute shall be of equal size. Where substituted for fiber rope of three inches (7.62 cm) or more in circumference, the size of the synthetic rope shall be determined from the formula.

$$C = \pm \sqrt{0.6C_s^2 + 0.4C_m^2}$$

Where C = the required circumference of the synthetic rope in inches, C_s = the circumference to the nearest one-quarter inch of a synthetic rope having a breaking strength not less than that of the size fiber rope that is required by paragraph (c) of this section, and C_m = the circumference of the fiber rope in inches that is required by paragraph (c) of this section.

(ii) In making such substitution, it shall be ascertained that the inherent characteristics of the synthetic fiber are suitable for hoisting.

(e) *Removal of natural and synthetic fiber from service.* Natural and synthetic rope having any of the following defects shall be removed from service:

(1) Abnormal wear;

(2) Powdered fiber between strands;

(3) Sufficient cut or broken fibers to affect the capability of the rope;

(4) Variations in the size or roundness of strands;

(5) Discolorations other than stains not associated with rope damage;

(6) Rotting; or

(7) Distortion or other damage to attached hardware.

(f) Thimbles. Properly fitting thimbles shall be used where any rope is secured permanently to a ring, shackle or attachment, where practicable.

(g) Synthetic web slings. **(1)** Slings and nets or other combinations of more than one piece of synthetic webbing assembled and used as a single unit (synthetic web slings) shall not be used to hoist loads in excess of the sling's rated capacity.

(2) Synthetic web slings shall be removed from service if they exhibit any of the following defects:

(i) Acid or caustic burns;

(ii) Melting or charring of any part of the sling surface;

(iii) Snags, punctures, tears, or cuts;

(iv) Broken or worn stitches; or

(v) Distortion or damage to fittings.

(vi) Display of visible warning threads or markers designed to indicate excessive wear or damage.

(3) Defective synthetic web slings removed from service shall not be returned to service unless repaired by a sling manufacturer or similar entity. Each repaired sling shall be proof tested by the repairer to twice the slings' rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.

(4) Synthetic web slings provided by the employer shall only be used in accordance with the manufacturer's use recommendations, which shall be available.

(5) Fittings shall have a breaking strength at least equal to that of the sling to which they are attached and shall be free of sharp edges.

(h) *Chains and chain slings used for hoisting.* **(1)** The employer shall adhere to the manufacturer's recommended ratings for safe working loads for the sizes of wrought iron and alloy steel chains and chain slings used and shall have such ratings available. When the manufacturer is unable to provide such ratings, the employer shall use the tables for chains and chain slings found in American National Safety Standard for Slings, ANSI 30.9-1971.

(2) Proof coil steel chain, also known as common or hardware chain, and other chain not recommended by the manufacturer for slinging or hoisting shall not be used for slinging or hoisting.

(3)(i) Sling chains, including end fastenings shall be inspected for visible defects before each day's use and as often as necessary during use to ensure integrity of the sling.

(ii) Thorough inspections of chains in use shall be made quarterly to detect wear, defective welds, deformation, or increase in length or stretch. The month of inspection shall be indicated on each chain by color of paint on a link or by other equally effective means.

(iii) Chains shall be removed from service when maximum allowable wear, as indicated in Table C-2, is reached at any point of link.

(iv) Chain slings shall be removed from service when stretch has increased the length of a measured section by more than five percent; when a link is bent, twisted or otherwise damaged; or when a link has a raised scarf or defective weld.

TABLE C-2 MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain Size		Maximum allowable wear	
Inches	(cm)	Inches	(cm)
$\frac{1}{4}$ ($\frac{9}{32}$)	(0.6)	$\frac{3}{64}$	(0.1)
$\frac{3}{8}$	(1.0)	$\frac{5}{64}$	(0.2)
$\frac{1}{2}$	(1.3)	$\frac{7}{64}$	(0.3)
$\frac{5}{8}$	(1.6)	$\frac{9}{64}$	(0.4)
$\frac{3}{4}$	(1.9)	$\frac{5}{32}$	(0.4)
$\frac{7}{8}$	(2.2)	$\frac{11}{64}$	(0.4)
1	(2.5)	$\frac{3}{16}$	(0.5)
$1 \frac{1}{8}$	(2.9)	$\frac{7}{32}$	(0.6)
$1 \frac{1}{4}$	(3.2)	$\frac{1}{4}$	(0.6)
$1 \frac{3}{8}$	(3.5)	$\frac{9}{32}$	(0.7)
$1 \frac{1}{2}$	(3.8)	$\frac{5}{16}$	(0.8)
$1 \frac{3}{4}$	(4.4)	$\frac{11}{32}$	(0.9)

(v) Only designated persons shall inspect chains used for slinging and hoisting.

(4) Chains shall be repaired only under qualified supervision. Links or portions of chain defective under any of the criteria of paragraph (h)(3)(iii) of this section shall be replaced with properly dimensioned links or connections of material similar to those of the original chain. Before repaired chains are returned to service, they shall be tested to the proof load recommended by the manufacturer for the original chain. Tests shall be performed by the manufacturer or shall be certified by an agency accredited for the purpose under

part 1919 of this chapter. Test certificates shall be available for inspection.

(5) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months. Heat treatment certificates shall be available for inspection. Alloy chains shall not be annealed.

(6) Kinked or knotted chains shall not be used for lifting. Chains shall not be shortened by bolting, wiring, or knotting. Makeshift links or fasteners such as wire, bolts, or rods shall not be used.

(7) Hooks, rings, links, and attachments affixed to sling chains shall have rated capacities at least equal to that of the chains to which they are attached.

(8) Chain slings shall bear identification of size, grade, and rated capacity.

(i) *Shackles.* (1) If available, the manufacturer's recommended safe working loads for shackles shall not be exceeded. In the absence of manufacturer's recommendations, Table C-3 shall apply.

(2) Screw pin shackles used aloft in house fall or other gear, except in cargo hook assemblies, shall have their pins moused or otherwise effectively secured.

TABLE C-3 - SAFE WORKING LOADS FOR SHACKLES

Material Size		Pin diameter		Safe working load in 2,000 lb tons (1800 kg)
Inches	cm	Inches	cm	
1/2	1.3	5/8	1.6	1.4
5/8	1.6	3/4	1.9	2.2
3/4	1.9	7/8	2.2	3.2
7/8	2.2	1	2.5	4.3
1	2.5	1 1/8	2.9	5.6
1 1/8	2.9	1 1/4	3.2	6.7
1 1/4	3.2	1 3/8	3.5	8.2
1 3/8	3.5	1 1/2	3.8	10.0
1 1/2	3.8	1 5/8	4.1	11.9
1 3/4	4.4	2	5.1	16.2
2	5.1	2 1/4	5.7	21.2

(j) Hooks other than hand hooks. (1) The manufacturers' recommended safe working loads for hooks shall not be exceeded. Hooks other than hand hooks shall be tested in accordance with §1917.50(c)(6).

(2) Bent or sprung hooks shall be discarded.

(3) Teeth of case hooks shall be maintained in safe condition.

(4) Jaws of patent clamp-type plate hooks shall be maintained in safe condition to grip plates securely.

(5) Loads shall be applied to the throat of the hook only.

(k) Pallets. (1) Pallets shall be made and maintained to safely support and carry loads being handled. Fastenings of reusable

pallets used for hoisting shall be bolts and nuts, drive screws (helically threaded nails), annular threaded nails, or fastenings of equivalent holding strength.

(2) Damaged pallets shall be stored in designated areas and identified.

(3) Reusable wing or lip-type pallets shall be hoisted by bar bridles or other suitable gear and shall have an overhanging wing or lip of at least three inches (7.62 cm). They shall not be hoisted by wire slings alone.

(4) Loaded pallets that do not meet the requirements of this paragraph shall be hoisted only after being placed on pallets meeting such requirements or shall be handled by other means providing equivalent safety.

(5) Bridles for handling flush end or box-type pallets shall be designed to prevent disengagement from the pallet under load.

(6) Pallets shall be stacked or placed to prevent falling, collapsing, or otherwise causing a hazard under standard operating conditions.

(7) Disposable pallets intended only for one use shall not be reused for hoisting.

§1917.43—Powered industrial trucks.

(a) *Applicability.* This section applies to every type of powered industrial truck used for material or equipment handling within a marine terminal. It does not apply to over-the-road vehicles.

(b) *General.* (1) After October 3, 1983, modifications, such as adding counterweights, that might affect the vehicle's capacity or safety shall not be performed without either the manufacturer's prior written approval or the written approval of a professional engineer experienced with the equipment who has consulted with the manufacturer, if available. Capacity, operation and maintenance

instruction plates, tags, or decals shall be changed to conform to the equipment as modified.

(2) Unauthorized personnel shall not ride on powered industrial trucks. A safe place to ride shall be provided when riding is authorized.

(3) When a powered industrial truck is left unattended, load-engaging means shall be fully lowered, controls neutralized and brakes set. Unless the truck is in view and within 25 feet (7.62 m) of the operator, power shall be shut off. Wheels shall be blocked or curbed if the truck is on an incline.

(4) Powered industrial trucks shall not be operated inside highway vehicles or railcars having damage which could affect operational safety.

(5) Powered industrial trucks shall be marked with their rated capacities, which shall be visible to the operator.

(6) Only stable and safely arranged loads within the rated capacity of the truck shall be handled.

(7) The employer shall direct drivers to ascend and descend grades slowly.

(8) The employer shall direct drivers to slow down and sound the horn at crossaisles and other locations where visibility is obstructed.

(9) If the load obstructs the forward view, the employer shall direct drivers to travel with the load trailing.

(10) Steering knobs shall not be used unless the truck is equipped with power steering.

(11) When powered industrial trucks use cargo lifting devices that have a means of engagement hidden from the operator, a means

shall be provided to enable the operator to determine that the cargo has been engaged.

(12) When cargo is being towed on pipe trucks or similar equipment, a safe means shall be provided to protect the driver from sliding loads.

(c) Maintenance. **(1)** Only designated persons shall perform maintenance and repair.

(2) Batteries on all powered trucks shall be disconnected during repairs to the primary electrical system unless power is necessary for testing and repair. On trucks equipped with systems capable of storing residual energy, that energy shall be safely discharged before work on the primary electrical system begins.

(3) Replacement parts whose function might affect operational safety shall be equivalent in strength and performance capability to the original parts which they replace.

(4) Braking systems or other mechanisms used for braking shall be operable and in safe condition.

(5) Powered industrial trucks shall be maintained in safe working order. Safety devices shall not be removed or made inoperative except as otherwise provided in this section. Trucks with a fuel system leak or any other safety defect shall not be operated.

(6) Those repairs to the fuel and ignition systems of industrial trucks that involve fire hazards shall be conducted only in locations designated as safe for such repairs.

(d) Approved trucks **(1)** *Approved power-operated industrial truck* means one listed or approved for the intended use by a nationally recognized testing laboratory.

(2) Approved trucks acquired and used after February 15, 1972, shall bear a label or other identification indicating testing laboratory approval.

(3) When the atmosphere in an area is hazardous and the provisions of United States Coast Guard regulations at 33 CFR 126.15(e) do not apply, only power-operated industrial trucks approved for such locations shall be used.

(e) Fork lift trucks. (1) Overhead guards. (i) When operators are exposed to overhead falling hazards, fork lift trucks shall be equipped with securely attached overhead guards. Guards shall be constructed to protect the operator from falling boxes, cartons, packages, or similar objects.

(ii) Overhead guards shall not obstruct the operator's view, and openings in the top of the guard shall not exceed six inches (15.24 cm) in one of the two directions, width or length. Larger openings are permitted if no opening allows the smallest unit of cargo being handled to fall through the guard.

(iii) Overhead guards shall be built so that failure of the vehicle's mast tilting mechanism will not displace the guard.

(iv) An overhead guard, otherwise required by this paragraph, may be removed only when it would prevent a truck from entering a work space and if the operator is not exposed to low overhead obstructions in the work space.

(v) Overhead guards shall be large enough to extend over the operator during all truck operations, including forward tilt.

(2) Load backrest extensions. Where necessary to protect the operator, fork lift trucks shall be fitted with a vertical load backrest extension to prevent the load from hitting the mast when the mast is positioned at maximum backward tilt. For this purpose, a "load backrest extension" means a device extending vertically from the fork carriage frame to prevent raised loads from falling backward.

(3) Forks. Forks, fork extensions, and other attachments shall be secured so that they cannot be accidentally dislodged, and shall be used only in accordance with the manufacturer's recommendations.

(4) Counterweights. Counterweights shall be so affixed that they cannot be accidentally dislodged.

(5) Capacities and weights.(i) Forklift truck rated capacities, with and without removable counterweights, shall not be exceeded. Rated capacities shall be marked on the vehicle and shall be visible to the operator. The vehicle weight, with and without counterweight, shall be similarly marked.

(ii) If loads are lifted by two or more trucks working in unison, the total weight of the load shall not exceed the combined rated lifting capacity of all trucks involved.

(6) Lifting of employees. Employees may be elevated by fork lift trucks only when a platform is secured to the lifting carriage or forks. The platform shall meet the following requirements:

(i) The platform shall have a railing complying with §1917.112(c).

(ii) The platform shall have toeboards complying with §1917.112(d) if tools or other objects could fall on employees below.

(iii) An employee shall be at the truck's controls whenever employees are elevated.

(iv) Employees on the platform shall be protected from exposure to moving truck parts.

(v) The platform floor shall be skid resistant.

(vi) When the truck has controls elevated with the lifting carriage, means shall be provided for employees on the platform to shut off power to the vehicle.

(vii) While employees are elevated, the truck may be moved only to make minor placement adjustments.

(f) Bulk cargo-moving vehicles.(1) Where a seated operator may come into contact with projecting overheads, crawler-type bulk-cargo-moving vehicles that are rider operated shall be equipped with operator's guards.

(2) Guards and their attachment points shall be so designed as to be able to withstand, without excessive deflection, a load applied horizontally at the operator's shoulder level equal to the drawbar pull of the machine.

(3) After July 26, 1999 bulk cargo-moving vehicles shall be equipped with rollover protection of such design and construction as to prevent the possibility of the operator being crushed because of a rollover or upset.

(g) Straddle trucks.(1) *Accessibility.* Straddle trucks shall have a permanent means of access to the operator's station, including any handholds necessary for safe ascent and descent.

(2) *Guarding.* (i) Main sprockets and chains to the wheels shall be guarded as follows:

(A) The upper sprocket shall be enclosed;

(B) The upper half of the lower sprocket shall be enclosed; and

(C) The drive chain shall be enclosed to a height of eight feet (2.44 m) except for that portion at the lower half of the lower sprocket.

(ii) Gears shall be enclosed and revolving parts which may be contacted by the operator shall be guarded.

(iii) When straddle trucks are used in the vicinity of employees, personnel-deflecting guards shall be provided around leading edges of front and rear wheels.

(3) *Visibility.* Operator visibility shall be provided in all directions of movement.

(h) Trailer-spotting tractors. **(1)** Trailer-spotting tractors (fifth wheels) shall be fitted with any hand grabs and footing necessary for safe access to the fifth wheel.

(2) Rear cab windows shall be of safety glass or of equivalent material.

§1917.44— General rules applicable to vehicles⁴.

(a) The requirements of this section apply to general vehicle use within marine terminals. *Exception:* The provisions of paragraphs (c) and (l) of this section do not apply when preempted by applicable regulations of the Department of Transportation.⁵

(b) Private vehicle parking in marine terminals shall be allowed only in designated areas.

(c) Trailers shall not be disconnected from tractors at loading docks until the road wheels have been immobilized. The road wheels shall be immobilized from the time the brake system is disconnected until braking is again provided. Supplementary front end support shall be employed as necessary to prevent tipping when a trailer is entered by a material handling vehicle. Rear end support shall be employed if rear wheels are so far forward as to allow tipping when the trailer is entered.

⁴The United States Coast Guard at 33 CFR 126.15(d) and (e) has additional regulations applicable to vehicles in terminals.

⁵Department of Transportation regulations in 49 CFR Part 393, Subpart C - Brakes, address the immobilization of trailer road wheels prior to disconnection of the trailer and until braking is again provided. Section 49 CFR 393.84 addresses the condition of flooring. These DOT rules apply when the motor carrier is engaged in interstate commerce or in the transport of certain hazardous items wholly within a municipality or the commercial zone thereof.

(d) The employer shall direct motor vehicle operators to comply with any posted speed limits and other traffic control signs or signals, and written traffic instructions.

(e) Stop signs shall be posted at main entrances and exits of structures where visibility is impaired, and at blind intersections, unless direct traffic control or warning mirror systems or other systems of equivalent safety are provided.

(f) Vehicular routes, traffic rules, and parking areas shall be established, identified, and used.

(g) The employer shall direct vehicle drivers to warn employees in traffic lanes of the vehicle's approach.

(h) Signs indicating pedestrian traffic shall be clearly posted at vehicular check-in and check-out lines and similar locations where employees may be working.

(i) A distance of not less than 20 feet (6.1 m) shall be maintained between the first two vehicles in a check-in, check-out, roadability, or vessel loading/discharging line. This distance shall be maintained between any subsequent vehicles behind which employees are required to work.

(j) No unattended vehicle shall be left with its engine running unless secured against movement (see §1917.43(b)(3) for powered industrial trucks).

(k) When the rear of a vehicle is elevated to facilitate loading or discharging, a ramp shall be provided and secured. The vehicle shall be secured against accidental movement during loading or discharging.

(l) Only highway vehicle floors in safe condition shall be used.

(m) When flatbed trucks, platform containers, or similar conveyances are loaded or discharged and the cargo consists of pipe or other products which could spread or roll to endanger employees, the cargo shall be contained to prevent movement.

(n) Vehicles used to transport employees within a terminal shall be maintained in safe working order and safety devices shall not be removed or made inoperative.

(o) *Servicing multi-piece and single piece rim wheels.* Servicing of multi-piece and single piece rim wheels is covered by §1910.177 of this chapter (See §1917.1(a)(2)(xii)).

(1) *Scope.* This paragraph applies to the servicing of vehicle wheels containing tube-type tires mounted on multi-piece rims.

(2) *Definition.* “Multi-piece rim” means a vehicle wheel rim consisting of two or more parts, one of which is a (side) locking ring designed to hold the tire on the rim by tension on interlocking components when the tire is inflated, regardless of the relative sizes of the component parts.

(3) *Employee training.* **(i)** Only employees trained in the procedures required in paragraph (o)(4) of this section and who have demonstrated their ability to service multi-piece rim wheels shall be assigned such duties.

(ii) Employees assigned such duties shall have demonstrated their ability by the safe performance of the following tasks:

(A) Tire demounting (including deflation);

(B) Inspection of wheel components;

(C) Mounting of tires;

(D) Inflation of tires, including use of a restraining device;

(E) Handling of wheels;

(F) Inflation of tires when a wheel is mounted on the vehicle; and

(G) Installation and removal of wheels.

(4) *Servicing procedures.* The following procedures shall be followed:

- (i)** Tires shall be completely deflated before demounting by removal of the valve core;
 - (ii)** The valve core shall be removed before the wheel is removed from the axle when:
 - (A)** The tire has been operated underinflated at 80% or less of its recommended pressure, or
 - (B)** There is discernible or suspected damage to the tire or wheel components;
 - (iii)** Mating surfaces shall be free of dirt, surface rust, scale, and rubber buildup before mounting;
 - (iv)** Rubber lubricant shall be applied to bead and rim mating surfaces upon wheel assembly and inflation of the tire;
 - (v)** Air pressure shall not exceed 3 psig (0.21 kg/cm²) when seating the locking ring or rounding out the tube when a tire is being partially inflated without a restraining device;
 - (vi)** While the tire is pressurized, components shall not be struck or forced to correct the seating of side or lock rings;
 - (vii)** There shall not be any contact between an employee or unit of equipment and a restraining device during tire inflation;
 - (viii)** After inflation, tires, rims, and rings shall be inspected while within the restraining device to ensure seating and locking. If adjustment is necessary the tire shall first be deflated by valve core removal; and
 - (ix)** Before assembly, wheel components shall be inspected and damaged rim components shall not be reused.
- (5) Charts and manuals.** **(i)** The employer shall provide a chart containing as a minimum the instructions and information provided in the United States Department of Transportation, National

Highway Traffic Safety Administration (NHTSA) publication “Safety Precautions for Mounting and Demounting Tube-Type Truck/Bus Tires” and “Multi-Piece Rim Wheel Matching Chart,” and pertinent to the type(s) of multi-piece rim wheels being serviced. The chart shall be available in the terminal’s service area.⁶

(ii) A current rim manual containing the manufacturer’s instructions for mounting, demounting, maintenance, and safety precautions relating to the multi-piece rim wheels being serviced shall be available in the terminal’s service area.

(6) *Restraining devices.* (i) Except as otherwise noted, inflation shall be done within a restraining device such as a cage, rack or other device capable of withstanding the maximum force that would be transferred to it during an explosive wheel separation occurring at 150% of maximum tire specification pressure for the wheels being serviced. The restraining device shall be capable of preventing rim components from being thrown outside the frame of the device for any wheel position within the device. When the wheel assembly is mounted on a vehicle, tires may be inflated without a restraining device only if they have more than 80% of the recommended pressure and if remote control inflation equipment is used and employees are clear of the danger area.

(ii) Restraining devices shall be kept in good repair and be capable of preventing rim components from being thrown outside the device.

(7) *Inflation hoses.* Inflation hoses shall have a manual clip-on chuck with sufficient hose to permit an employee to be clear of the danger zone. An in-line, manually operated valve with gauge or a preset pressure regulator shall be used to inflate tires.

⁶NHTSA charts are available from General Services Division, National Highway Traffic Safety Administration, Attention: N48-51, 400 Seventh Street, S.W., Washington, D.C. 20590. Industry charts are available upon request from the manufacturer.

(8) Other equipment. (i) Only tools recommended in the rim manual for the type of wheel being serviced shall be used to service multi-piece rim wheels.

(ii) Wheel components shall not be interchanged except as provided in the applicable chart or manual.

§1917.45—Cranes and derricks (See also §1917.50).

(a) Coverage. (1) This section applies to every kind of crane and derrick and to any other type of equipment performing the functions of a crane or derrick except as noted in paragraph (a)(2) of this section.

(2) This section does not apply to small industrial truck-type cranes, container handling top-loaders and sideloaders, chain hoists, and mobile straddle-type cranes incapable of straddling two or more intermodal containers (16 feet, (4.88 m) in width.)

(b) Ratings. (1) Except for bridge cranes covered by paragraph (g) of this section, cranes and derricks having ratings that vary with boom length, radius (outreach), or other variables shall have a durable rating chart visible to the operator, covering the complete range of the manufacturer's (or design) capacity ratings. The rating chart shall include all operating radii (outreach) for all permissible boom lengths and jib lengths as applicable, with and without outriggers, and alternate ratings for optional equipment affecting such ratings. Precautions or warnings specified by the owner or manufacturer shall be included along with the chart.

(2) The manufacturer's (or design) rated loads for the conditions of use shall not be exceeded.

(3) Designated working loads shall not be increased beyond the manufacturer's ratings or original design limitations unless such increase receives the manufacturer's approval. When the manufacturer's services are not available or where the equipment is of foreign manufacture, engineering design analysis shall be performed or approved by a person accredited for certifying the

equipment under Part 1919 of this chapter. Engineering design analysis shall be performed by a registered professional engineer competent in the field of cranes and derricks. Any structural changes necessitated by the change in rating shall be carried out.

(c) *Radius indicator.* When the rated load varies with the boom radius, the crane or derrick shall be fitted with a boom angle or radius indicator visible to the operator.

(d) *Prohibited usage.* **(1)** Equipment shall not be used in a manner that exerts sideloading stresses upon the crane or derrick boom.

(2) No crane or derrick having a visible or known defect that affects safe operation shall be used.

(e) *Protective devices.* **(1)** When exposed moving parts such as gears, chains, and chain sprockets present a hazard to employees during crane and derrick operations, those parts shall be securely guarded.

(2) Crane hooks shall be latched or otherwise secured to prevent accidental load disengagement.

(f) *General.* **(1) *Operating controls.*** **(i)** Crane and derrick operating controls shall be clearly marked, or a chart indicating their function shall be posted at the operator's position.

(ii) After October 3, 1984, overhead bridge and container gantry crane operating control levers shall be self-centering so that they will automatically move to the "off" position when the operator releases the control.

(2) *Booms.* Cranes with elevatable booms and without operable automatic limiting devices shall be provided with boom stops if boom elevation can exceed maximum design angles from the horizontal.

(3) *Foot pedals.* Foot pedals shall have a non-skid surface.

(4) Access. Ladders, stairways, stanchions, grab irons, foot steps, or equivalent means shall be provided as necessary to ensure safe access to footwalks, cab platforms, the cab, and any portion of the superstructure which employees must reach.

(i) Footwalks shall be of rigid construction and shall be capable of supporting a load of 100 pounds (4.79 kPa) per square foot.

(ii) If more than 20 feet (6.1 m) in height, vertical ladders shall comply with §1917.118 (d), (e)(1), (e)(2)(iii), and (e)(2)(iv).

(iii) Stairways on cranes shall be equipped with rigid handrails meeting the requirements of §1917.112(e).

(iv) If the top of a ladder or stairway or any position thereof is located where a moving part of a crane, such as a revolving house, could strike an employee ascending or descending the ladder or stairway, a prominent warning sign shall be posted at the foot of the ladder or stairway. A system of communication (such as a buzzer or bell) shall be established and maintained between the foot of the ladder or stairway and the operator's cab.

(5) Operator's station. **(i)** The cab, controls and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signalman, when one is used. Cab glass, when used, shall be safety plate glass or equivalent. Cranes with missing, broken, cracked, scratched, or dirty glass (or equivalent) that impairs operator visibility shall not be used. Clothing, tools and equipment shall be stored so as not to interfere with access, operation, and the operator's view.

(ii) A seat (lap) belt, meeting the requirements of 49 CFR 571.208-210 for a Type 1 seat belt assembly, shall be installed on the operator's seat of high speed container gantry cranes where the seat trolleys.

(6) Counterweights or ballast. Cranes shall be operated only with the specified type and amount of ballast or counterweights. Ballast or counterweight shall be located and secured only as provided in

the manufacturer's or design specifications, which shall be available.

(7) Outriggers. Outriggers shall be used according to the manufacturers' specifications or design data, which shall be available. Floats, when used, shall be securely attached to the outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety, and be of sufficient width and length to prevent the crane from shifting or toppling under load.

(8) Exhaust gases. Engine exhaust gases shall be discharged away from the normal position of crane operating personnel.

(9) Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair.

(10) Fire extinguisher. (i) At least one portable fire extinguisher of at least 5 - BC rating or equivalent shall be accessible in the cab of the crane or derrick.

(ii) No portable fire extinguisher using carbon tetrachloride or chlorobromomethane extinguishing agents shall be used.

(11) Rope on drums. At least three full turns of rope shall remain on ungrooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by clamps, U-bolts, shackles, or equivalent means. Fiber rope fastenings are prohibited.

(12) Assembly or disassembly of boom sections. Mobile crane booms being assembled or disassembled on the ground with or without the support of the boom harness shall be blocked to prevent dropping of the boom or boom sections.

(13) Brakes. (i) Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applied directly to the motor shaft or gear train.

(ii) Each independent hoisting unit of a crane, except worm geared hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction, shall, in addition to a holding brake, be equipped with a controlled braking means to control lowering speeds.

(iii) Holding brakes for hoist units shall have not less than the following percentage of the rated load hoisting torque at the point where the brake is applied:

(A) 125 percent when used with an other than mechanically controlled braking means; or

(B) 100 percent when used with a mechanically-controlled braking means.

(C) 100 percent when two holding brakes are provided.

(iv) All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

(g) Rail-mounted cranes (excluding locomotive types). **(1)** For the purposes of this section, rail-mounted cranes include bridge cranes and portal cranes.

(2) Rated load marking. The rated loads of bridge cranes shall be plainly marked on each side of the crane and in the cab. If there is more than one hoisting unit, each hoist shall have its rated load marked on it or on its load block. Markings shall be legible from the ground level.

(3) Wind-indicating devices. **(i)** After October 3, 1983, each rail-mounted bridge and portal crane located outside of an enclosed structure shall be fitted with an operable wind-indicating device.

(ii) The wind indicating device shall provide a visible or audible warning to alert the operator of high wind conditions. That warning shall be transmitted whenever the following circumstances are present:

(A) When wind velocity reaches the warning speed, not exceeding the crane manufacturer's recommendations; and

(B) When wind velocity reaches the shutdown speed, not exceeding the crane manufacturer's recommendations, at which time work is to be stopped and the crane secured.

(iii) Instructions. The employer shall post operating instructions for high wind conditions in the operator's cab of each crane. Operators shall be directed to comply with these instructions. The instructions shall include procedures for responding to high wind alerts and for any coordination necessary with other cranes.

(4) Securing of cranes in high winds. **(i)** When the wind reaches the crane's warning speed:

(A) Gantry travel shall be stopped; and

(B) The crane shall be readied for shutdown.

(ii) When the wind reaches the crane's shutdown speed:

(A) Any portion of the crane spanning or partially spanning a vessel shall be moved clear of the vessel if safe to do so; and

(B) The crane shall be secured against travel, using all available means of securing.

(5) The employer shall monitor local weather conditions by subscribing to a weather service or using equally effective means.

(6) Stops and bumpers. **(i)** The ends of all tracks shall be equipped with stops or bumpers. If a stop engages the tread of the wheel, it shall be of a height not less than the radius of the wheel.

(ii) When more than one crane operates on the same runway or more than one trolley on the same bridge, each crane or trolley shall be equipped with bumpers or equivalent devices at adjacent ends subject to impact.

(7) *Employee exposure to crane movement.* When employees may be in the vicinity of the tracks, crane trucks shall be equipped with personnel deflecting guards.

(8) *Pedestrian clearance.* If the track area is used for employee passage or for work, a minimum clearance of three feet (.91 m) shall be provided between trucks or the structures of rail-mounted cranes and any other structure or obstruction. When the required clearance is not available on at least one side of the crane's trucks, the area shall not be used and shall be marked and identified.

(9) *Warning devices.* Rail-mounted cranes shall be equipped with an effective travel warning device which shall be used to warn employees who may be in the path of the moving crane.

(10) *Communications.* Means of communication shall be provided between the operator's cab and the base of the gantry of all rail-mounted cranes. This requirement may be met by telephone, radio, sound-signaling system, or other effective methods, but not solely by hand-signaling.

(11) Limit switch bypass systems shall be secured during all cargo operations. Such bypass systems shall not be used except in an emergency or during non-cargo handling operations such as stowing cranes or derricks or performing repairs. When a situation requiring the use of a bypass system or the readjustment of a limit switch arises, it shall be done only under the direction of a crane mechanic.

(h) *Stabilizing of locomotive cranes.* Loads may be hoisted by locomotive cranes only if outriggers are in place, unless means are taken to prevent the load being carried by the truck springs of the crane.

(i) *Operations.* **(1) *Use of cranes together.*** When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the load, and movements to be made.

(2) Guarding of swing radius. Accessible areas within the swing radius of the body of a revolving crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure or between parts of the crane.

(3) Securing mobile crane components in transit. The crane's superstructure and boom shall be secured against rotation and carried in line with the direction of travel except when negotiating turns with an operator in the cab or when the boom is supported on a dolly. The empty hook or other attachment shall be secured.

(4) Unattended cranes. The following steps shall be taken before leaving a crane unattended between work periods:

(i) Suspended loads, such as those hoisted by lifting magnets or clamshell buckets, shall be landed unless the storage position or maximum hoisting of the suspended device will provide equivalent safety;

(ii) Clutches shall be disengaged;

(iii) The power supply shall be shut off;

(iv) The crane shall be secured against accidental travel; and

(v) The boom shall be lowered or secured against movement.

(5) Operating near electric power lines. (i) Clearance. Unless electrical distribution and transmission lines are de-energized and visibly grounded at the point of work, or unless insulating barriers not a part of or attached to the crane have been erected to prevent physical contact with lines, cranes may be operated near power lines only in accordance with the following:

(A) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet (3.05 m);

(B) For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be either 10 feet (3.05

m) plus 0.4 inch (10.16 mm) for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet (3.05 m); and

(C) In transit with no load and boom lowered, the clearance shall be a minimum of 4 feet (1.22m).

(ii) Boom guards. Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but they shall not be used in place of the clearances required by paragraph (i)(5)(i) of this section.

(iii) Determination of energized lines. Any overhead line shall be presumed to be energized until the owner of the line indicates that it is not energized.

(j) Protection for employees being hoisted. (1) No employee shall be hoisted by the load hoisting apparatus of a crane or derrick except:

(i) On intermodal container spreaders, equipped in accordance with paragraph (j)(8) of this section; or

(ii) In a boatswain's chair or other device rigged to prevent it from accidental disengagement from the hook or supporting member; or

(iii) On a platform meeting the following requirements:

(A) Enclosed by a railing or other means providing protection equivalent to that described in §1917.112(c). If equipped with open railings, the platform shall be fitted with toe boards;

(B) Having a safety factor of four based on ultimate strength;

(C) Bearing a plate or permanent marking indicating maximum load rating, which shall not be exceeded, and the weight of the platform itself;

(D) Equipped with a device to prevent access doors, when used, from opening accidentally;

(E) Equipped with overhead protection for employees on the platform if they are exposed to falling objects or overhead hazards;

(F) Secured to the load line by means other than wedge and socket attachments, unless the free (bitter) end of the line is secured back to itself by a clamp placed as close above the wedge as possible.

(2) Except in an emergency, the hoisting mechanism of all cranes or derricks used to hoist personnel shall operate only in power up and power down, with automatic brake application when not hoisting or lowering.

(3) Variable radius booms of a crane or derrick used to hoist personnel shall be so constructed or secured as to prevent accidental boom movement.

(4) Platforms or devices used to hoist employees shall be inspected for defects before each day's use and shall be removed from service if defective.

(5) Employees being hoisted shall remain in continuous sight of and communication with the operator or signalman.

(6) Operators shall remain at the controls when employees are hoisted.

(7) Cranes shall not travel while employees are hoisted, except in emergency or in normal tier to tier transfer of employees during container operations.

(8) When intermodal container spreaders are used to transfer employees to or from the tops of containers, the spreaders shall be equipped with a personnel platform equipped with fixed railings, provided that the railings have one or more openings for access. The openings shall be fitted with a means of closure, such as chains with hooks. Existing railings shall be at least 36 inches (0.91 m) in height. New railings installed after October 3, 1983 shall be 42 inches (1.07 m), plus or minus 3 inches (7.62 cm), in height. The provisions of paragraphs (j)(1)(iii)(C), (j)(1)(iii)(D),

and (j)(1)(iii)(F) of this section also apply to personnel platforms when such container spreaders are used.

(9) Employees shall not be hoisted on intermodal container spreaders while a load is engaged.

(10) All cranes and derricks used to hoist personnel shall be equipped with an anti-two-blocking device.

(k) *Routine inspection.* (1) Designated persons shall visually inspect each crane and derrick on each day of use for defects in functional operating components and shall report any defect found to the employer. The employer shall inform the operator of the findings.

(2) A designated person shall thoroughly inspect all functional components and accessible structural features of each crane or device at monthly intervals.

(3) Any defects found during such inspections which may create a safety hazard shall be corrected before further equipment use. Repairs shall be performed only by designated persons.

(4) A record of monthly inspections shall be maintained for six months in or on the crane or derrick or at the terminal.

§1917.46—Load indicating devices.

(a)(1) Except as provided in paragraph (a)(1)(viii) of this section, every crane after October 3, 1984 shall be fitted with a load indicating device or alternative device in proper working condition which shall meet the following criteria:

(i) The type or model or any load indicating or alternate device which is used shall provide:

(A) A direct indication in the cab of actual weight hoisted or a means of determining this by referencing a weight indication to crane ratings posted and visible to the operator, except that the use

of a dynamometer or simple scale alone will not meet this requirement; or

(B) Indications in the cab according to the radius and load at the moment; or

(C) A direct means to prevent an overload from occurring.

(ii) The accuracy of the load indicating device, weight-moment device, or overload protection device shall be such that any indicated load (or limit), including the sum of actual weight hoisted and additional equipment or “add ons” such as slings, sensors, blocks, etc., is within the range between 95 percent (5 percent underload) and 110 percent (10 percent overload) of the actual true total load. Such accuracy shall be required over the range of daily operating variables reasonably anticipated under the conditions of use.

(iii) The device shall permit the operator to determine, before making any lift, that the indicating or substitute system is operative. In the alternative, if a device is so mounted or attached to preclude such a determination, it may not be used unless it has been certified by the manufacturer to remain operable within the limits stated in paragraph (a)(1)(ii) of this section for a specific period of use. Checks for accuracy, using known values of load, shall be performed at the time of every certification survey (see §1917.50) and at such additional times as may be recommended by the manufacturer.

(iv) When a load indicating device or alternative system is so arranged in the supporting system (crane structure) that its failure could cause the load to be dropped, its strength shall not be the limiting factor of the supporting system (crane structure).

(v) Marking shall be conspicuously placed giving: units of measure in pounds or both pounds and kilograms, capacity of the indicating system, accuracy of the indicating system, and operating instructions and precautions. In the case of systems utilizing indicators other than actual weights, the marking shall include data on: the

means of measurement, capacity of the system, accuracy of the system, and operating instructions and precautions. If the system used provides no readout, but is such as to automatically cease crane operation when the rated load limit under any specific condition of use is reached, marking shall be provided giving the make and model of the device installed, a description of what it does, how it is operated, and any necessary precautions regarding the system. All weight indicators, other types of loading indicators, and other data required shall be readily visible to the operator.

(vi) All load indicating devices shall be operative over the full operating radius. Overall accuracy shall be based on actual applied load and not on full scale (full capacity) load.

EXPLANATORY NOTE: For example, if accuracy of the load indicating device is based on full scale load and the device is arbitrarily set at plus/minus 10 percent, it would accept a reading between 90,000 lbs. (40.5 metric tons) and 110,000 lbs. (49.5 metric tons), at full capacity of a machine with 100,000 lbs. (45 metric tons) maximum rating, but would also allow a reading between zero and 20,000 lbs. (9 metric tons), at that outreach (radius) at which the rating would be 10,000 lbs. (4.5 metric tons) capacity— an unacceptable figure. If, however, accuracy is based on actual applied load under the same conditions, the acceptable range would remain the same with the 100,000 lb.(45 metric tons) load but becomes a figure between 9,000 (4 metric tons) and 11,000 lbs.(4.9 metric tons), a much different and acceptable condition, at the 10,000 lb. (4.5 metric tons) load.

(vii) When the device uses the radius as a factor in its use or in its operating indications, the indicated radius (which may be in feet and/or meters, or degrees of boom angle, depending on the system used) shall be a figure which is within the range of a figure no greater than 110 percent of the actual radius to a figure which is no less than 97 percent of the actual (true) radius. A conversion chart shall be provided whenever it is necessary to convert between degrees of radius and feet or meters.

(viii) The load indicating device requirements of this subparagraph do not apply to a crane:

(A) Of trolley equipped bridge type or overhead type while handling intermodal containers known to be identified as empty, or loaded, and in either case in compliance with the provisions of §1917.71, or while hoisting other lifts by means of a lifting beam supplied by the crane manufacturer for the purpose, and in all cases within the crane rating;

(B) While handling bulk commodities or cargoes by means of clamshell bucket or magnet;

(C) While used to handle or hold hoses in connection with transfer of bulk liquids or other hose handled products; or

(D) While the crane is used exclusively to handle cargo or equipment the total actual gross weight of which is known by means of marking of the unit or units hoisted, when such total actual gross weight never exceeds 11,200 lbs. (5 metric tons), and when 11,200 lbs. (5 metric tons), is less than the rated capacity of the crane at the maximum outreach that is possible under the conditions of use at the time.

§1917.47—Winches.

(a) Moving winch parts which present caught-in hazards to employees shall be guarded.

(b) Winches shall have clearly identifiable and readily accessible stop controls.

(c) Portable winches shall be secured against accidental shifting while in use.

(d) Portable winches shall be fitted with limit switches if employees have access to areas from which it is possible to be drawn into the winch.

(e) The provisions of §1917.45(f)(11) shall apply to winches.

§1917.48—Conveyors.

(a) *Guards.* (1) Danger zones at or adjacent to conveyors shall be guarded to protect employees.

(2) An elevated walkway with guardrail or equivalent means of protection shall be provided where employees cross over moving conveyors, and suitable guarding shall be provided when employees pass under moving conveyors.

(b) *Moving parts.* Conveyor rollers and wheels shall be secured in position.

(c) *Positioning.* Gravity conveyor sections shall be firmly placed and secured to prevent them from falling.

(d) *Braking.* (1) When necessary for safe operation, provisions shall be made for braking objects at the delivery end of the conveyor.

(2) Conveyors using electrically released brakes shall be constructed so that the brakes cannot be released until power is applied, and so that the brakes are automatically engaged if the power fails or the operating control is returned to the “stop” position.

(e) *Stability.* Portable conveyors shall be stable within their operating ranges. When used at variable fixed levels, the unit shall be secured at the operating level.

(f) *Emergency stop devices.* Readily accessible stop controls shall be provided for use in an emergency. Whenever the operation of any power conveyor requires personnel to work in the immediate vicinity of the conveyor, the conveyor or controls shall not be left unattended while the conveyor is in operation.

(g) Starting powered conveyors. Powered conveyors shall not be started until all employees are clear of the conveyor or have been warned that the conveyor is about to start.

(h) Loading and unloading. The area around conveyor loading and unloading points shall be kept clear of obstructions during conveyor operations.

(i) Lockout/Tagout. (1) Conveyors shall be stopped and their power sources locked out and tagged out during maintenance, repair, and servicing, unless power is necessary for testing.

(2) The starting device shall be locked out and tagged out in the stop position before an attempt is made to remove the cause of a jam or overload of the conveying medium, unless it is necessary to have the power on to remove the jam.

(j) Safe practices. (1) Only designated persons shall operate, repair, or service powered conveyors.

(2) The employer shall direct employees to stay off operating conveyors.

(3) Conveyors shall be operated only with all overload devices, guards, and safety devices in place and operable.

§1917.49—Spouts, chutes, hoppers, bins, and associated equipment.

(a) Standing and running rigging and associated gear used as a permanent part of spouts, chutes, or similar devices shall be inspected before each use and shall not be used if it has any functional defects. (See also §1917.50(c)(2) for certification requirements.)

(b) Direct communication shall be provided between the discharge or shipboard control end of loading spouts and chutes and the point in the terminal from which the flow of cargo is controlled.

(c) Chute and hopper openings which present a hazard shall be guarded to prevent employees from falling through them.

(d) When employees are working on hoppers, the hopper shall be equipped with a safe walkway and means of access.

(e) When necessary for the safety of employees, chutes shall be equipped with sideboards to afford protection from falling objects.

(f) Chutes shall be firmly placed and secured to prevent them from falling.

(g) When necessary for the safety of employees, provisions shall be made for braking objects other than bulk commodities at the delivery end of the chute.

(h) Before an employee enters an empty bin:

(1) Personnel controlling the flow of cargo into the bin shall have been notified of the entry; and

(2) The power supply to the equipment carrying the cargo to the bin shall be turned off, locked out and tagged.

(i) Before an employee enters a bin containing a bulk commodity such as coal or sugar, the employer shall ensure that:

(1) Personnel controlling the flow of cargo into the bin have been notified of the entry;

(2) The power supply to the equipment carrying the cargo to the bin is turned off, locked out, and tagged.

(3) The employee entering the bin wears a lifeline and safety harness; and

(4) A standby attendant equipped to perform a rescue is continuously stationed outside the bin until the employee has left the bin.

(j) Bin top openings that present a hazard to employees shall be covered to prevent employees from falling into bins.

(k) Chutes and hoppers shall be repaired only by designated persons.

(l)(1) Before power shoveling operations begin, a designated person shall inspect the equipment to be used. The inspection shall include at least the eye bolts, wires, and sheaves.

(2) Power shovels and associated equipment with defects affecting safe operation shall not be used.

(3) Before adjustments are made to a power shovel, wire, or associated equipment, the power supply to the shovel shall be turned off, locked out, and tagged, the belt stopped, and the hopper closed.

§1917.50—Certification of marine terminal marine handling devices (See also Mandatory Appendix I, Part 1917).

(a) The employer shall not use any material handling device listed in paragraph (c) of this section until he has ascertained that the device has been certificated, as evidenced by current and valid documents attesting to compliance with the requirements of paragraph (b) of this section.

(1) Certification surveys are to be completed for the conditions of use found at the time such surveys are completed, with the understanding that equipment owners/users can change the configurations of the equipment according to the manufacturer's specifications without affecting the established certification status for the equipment.

(2) In cases of foreign manufactured cranes, there shall be an owner's warranty that the design is adequate for the intended use. The warranty shall be based on a thorough examination of the design specifications by a registered professional engineer familiar with the equipment.

(b) The certifications required by this section shall be performed:

(1) In accordance with Part 1919 of this chapter, by persons then currently accredited by the Occupational Safety and Health Administration as provided in that part; or

(2) In accordance with standards established and enforced by the state in which the device is located or by a political subdivision thereof, which have been found by the Secretary to be compatible with Part 1919 of this chapter, by persons designated as competent to perform such certification by competent state authority, and recognized as such by the Secretary.

(c) The marine terminal material handling devices listed below shall be certificated in the following manner:

(1) Each crane and derrick shall be tested as a unit quadrennially, and shall be examined annually. Certificates of tests and examinations shall be made readily available for inspection.

(2) Bulk cargo spouts and suckers, together with any portable extensions and rigging or outriggers supporting them vertically, shall be examined annually. Certificates attesting to the required examination shall be made readily available for inspection.

(3) Vertical pocket or bucket conveyors such as banana, sugar, and grain marine legs (other than those within a grain elevator structure) used within a marine terminal facility shall be examined annually. The annual examination shall include all supporting structures, rigging and mechanical components and observation of all steps of operations. Certificates attesting to the required examinations shall be readily available for inspection.

(4)(i) House fall cargo-handling gear in use shall be proof load tested as a unit upon initial certification and every fourth year thereafter. An examination shall be carried out in conjunction with each unit proof load test and annually thereafter. The unit test shall consist of a proof load of 25 percent in excess of the rated safe working load. Examinations shall include all supporting structures

and components. Certificates attesting to the required tests and examinations shall be readily available for inspection.

(ii) House fall span beams or other house fall block supports shall be marked with the safe working load, which shall not be exceeded.

(5) Special gear. **(i)** Special stevedoring gear provided by the employer, the strength of which depends upon components other than commonly used stock items such as shackles, ropes, or chains, and that has a Safe Working Load (SWL) greater than five short tons (10,000 lbs or 4.54 metric tons) shall be inspected and tested as a unit before initial use (see Table A of this section). In addition, any special stevedoring gear that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.

(ii) Special stevedoring gear provided by the employer that has a SWL of five short tons (10,000 or 4.54 metric tons) or less shall be inspected and tested as a unit before initial use according to paragraphs (d) and (e) of this section or by a designated person (see Table A of this section).

TABLE A

Safe working load	Proof load
Up to 20 short tons (18.1 metric tons)	25 percent in excess
From 20 through 50 short tons (18.1 to 45.4 metric tons)	5 short tons in excess
Over 50 short tons (45.4 metric tons)	10 percent in excess

(iii) Every spreader that is not a part of ship's gear and is used for handling intermodal containers shall be inspected and tested before initial use to a proof load equal to 25 percent greater than its rated capacity. In addition, any spreader that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.

(iv) All cargo handling gear covered by this section with a SWL greater than five short tons (10,000 lbs. or 4.54 metric tons) shall be proof load tested according to table A of this section every 4 years in accordance with paragraph (b) of this section or by a designated person.

(v) Certificates and inspection and test records attesting to the tests required by this section shall be available for inspection.

(6) Wire rope and loose gear obtained after October 3, 1983, and used for material handling shall have been tested and certificated before being placed into use in accordance with the provisions of paragraphs (a), (c), and (d) of §§1919.31 and 1919.32 through 1919.34 of this chapter as applicable. Certificates attesting to the required tests, inspections and examinations shall be available.

(d) Disassembly and reassembly of equipment does not require recertification of the equipment provided that the equipment is reassembled and used in a manner consistent with its certification.

(e) For equipment certificated in accordance with paragraph **(b)(2)** of this section and transferred to a job site in another state, the current certification shall remain valid until the next inspection or examination becomes due.

(f) Certification procedures shall not be construed as a substitute for, or cause for, elimination of normal operational inspection and maintenance routine throughout the year.

(g)(1) Every unit of equipment requiring quadrennial certification shall have had such quadrennial certification within the previous 48 months. Equipment requiring annual certification shall have had such annual certification within the previous 12 months, except that no annual certification is required within 12 months after any required quadrennial certification. Annual examinations for certification may be accomplished up to one month early without effect on subsequent due dates.

(2) When certificated equipment is out of service for 6 months or more beyond the due date of a certification inspection, an examination equivalent to an initial certification, including unit proof load test, shall be performed before the equipment re-enters service.

(h) Loose gear obtained after October 3, 1983 shall bear a legible mark indicating that it has been tested (see paragraph **(c)(6)** of this section). Single sheave blocks shall be marked with safe working loads and proof test loads. Marks relating to testing shall be identifiable on the related certificates, which shall be available.

(i) Safe working load. (1) The safe working load of gear as specified in this section shall not be exceeded.

(2) All cargo handling gear provided by the employer with a safe working load greater than five short tons (10,000 lbs. or 4.54 metric tons) shall have its safe working load plainly marked on it.

(j) *Exceptions:* The certification requirements of this section do not apply to the following equipment:

(1) Small industrial crane trucks as described and illustrated in ASME B56.1, 1959, “Safety Code for Powered Industrial Trucks”, and powered industrial trucks; and

(2) Any straddle truck not capable of straddling two or more intermodal containers 16 feet (4.88 m) in width.

(3) Gear used only for handling or holding hoses, handling ships’ stores or handling the gangway.

§1917.51—Hand tools.

(a) Hand tools used by employees shall be maintained in safe operating condition.

(b)(1) Hand-held portable electric tools shall be equipped with switches that must be manually held in a closed position to operate the tool.

(2) Portable power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc needed to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc needed to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(c) Only cutting tools shall be used to cut metal strapping or banding used to secure cargo.

Subpart D—Specialized Terminals

§1917.70—General.

The provisions of this Subpart D shall apply to specialized terminals in addition to any other applicable requirements of this part.

§1917.71—Terminals handling inter-modal containers or roll-on, roll-off operations.

(a) Every intermodal container shall be legibly and permanently marked with:

- (1) The weight of the container when empty, in pounds;
- (2) The maximum cargo weight the container is designed to carry, in pounds; and
- (3) The sum of the weight of the container and the cargo, in pounds.

(b) No container shall be hoisted by any crane or derrick unless the following conditions have been met:

(1) The employer shall ascertain from the carrier whether a container to be hoisted is loaded or empty. Empty containers shall be identified before loading or discharge in such a manner as will inform every supervisor and foreman on the site and in charge of loading or discharging, or every crane or other hoisting equipment operator and signalman, if any, that such container is empty. Methods of identification may include cargo plans, manifests or markings on the container.

(2) In the case of a loaded container:

(i) The actual gross weight shall be plainly marked so as to be visible to the crane or other hoisting equipment operator or signalman, or to every supervisor and foreman on the site and in charge of the operation; or

(ii) The cargo stowage plan or equivalent permanently recorded display serving the same purpose, containing the actual gross weight and the serial number or other positive identification of that specific container, shall be provided to the crane or other hoisting equipment operator and signalman, if any, and to every supervisor and foreman on the site and in charge of the operation.

(3) Every outbound loaded container which is received at a marine terminal ready to load aboard a vessel without further consolidation or loading shall be weighed to obtain the actual gross weight, either at the terminal or elsewhere, before being hoisted.

(4)(i) When container weighing scales are located at a marine terminal, any outbound container with a load consolidated at that terminal shall be weighed to obtain an actual weight before being hoisted.

(ii) If the terminal has no scales, the actual gross weight may be calculated on the basis of the container's contents and the container's empty weight. The weights used in the calculation shall be posted conspicuously on the container, with the name of the person making the calculation and the date.

(5) Open type vehicles carrying containers and those built specifically and used solely for the carriage of compressed gases are excepted from paragraphs **(b)(3)** and **(b)(4)** of this section.

(6) Closed dry van containers carrying vehicles are exempted from paragraph **(b)(4)** of this section provided that:

(i) The container carries only completely assembled vehicles and no other cargo;

(ii) The container is marked on the outside in such a manner that an employee can readily discern that the container is carrying vehicles; and

(iii) The vehicles were loaded into the container at the marine terminal.

(7) The weight of loaded inbound containers from foreign ports shall be determined by weighing or by the method of calculation described in paragraph **(b)(4)(ii)** of this section or by shipping documents.

(8) Any scale used within the United States to weigh containers for the purpose of the requirements of this section shall meet the accuracy standards of the state or local public authority in which the scale is located.

(c) No container or containers shall be hoisted if their actual gross weight exceeds the weight marked as required in paragraph **(a)(2)** of this section, or if it exceeds the capacity of the crane or other hoisting device intended to be used.

(d)(1) Marked or designated areas shall be set aside within a container or roll-on roll-off terminal for passage of employees to and from active cargo transfer points, except where transportation to and from those points is provided by the employer.

(2) The employer shall direct employees to stay clear of the area beneath a suspended container.

(e) Each employee working in the immediate area of container handling equipment or in the terminal's traffic lanes shall wear a high visibility vest (or equivalent protection).⁷

NOTE TO PARAGRAPH (e): High visibility vests or equivalent protection means high visibility/retro-reflective materials which are intended to make the user clearly visible by day through the use of high visibility (fluorescent) material and in the dark by vehicle headlights through the use of retro-reflective material. For example, an acceptable area of material for a vest or equivalent protection is .5m² (760 in.²) for fluorescent (background) material and .13m² (197in.²) for retro-reflective material. Vests or equivalent protection, such as high visibility/retro-reflective coveralls, that are currently available for industrial use, may also be acceptable.

⁷Decals on hard hats will not be considered equivalent protection for the purposes of this paragraph.

(f) Containers shall be handled using lifting fittings or other arrangements suitable and intended for the purpose as set forth in paragraphs **(f)(1)** through **(f)(4)** of this section, unless damage to an intermodal container makes special means of handling necessary.

(1) Loaded intermodal containers of 20 feet (6.1 m) or more in length shall be hoisted as follows:

(i) When hoisting containers by the top fittings, the lifting forces shall be applied vertically from at least four such fittings. A less than vertical lift is permitted only under the following conditions:

(A) The container being lifted is an ISO closed box container;

(B) The condition of the box is sound;

(C) The speed of hoisting and lowering is moderated when heavily laden containers⁸ are encountered;

(D) The lift angle is at 80 to 90 degrees;

(E) The distance between the lifting beam and the load is at least 8 feet and 2.4 inches (2.5 m); and

(F) The length of the spreader beam is at least 16.3 feet (5 m) for a 20-foot (6.09 m) container, and at least 36.4 feet (11 m) for a 40-foot (12.09 m) container.

(ii) If hoisted from bottom fittings, the hoisting connections shall bear on the fittings only, making no other contact with the container. The angles of the four bridle legs shall not be less than 30 degrees to the horizontal in the case of 40 feet (12.2 m) containers, 37 degrees in the case of 30 feet (9.1 m) containers, and 45 degrees in the case of 20 feet (6.1 m) containers.

⁸ A heavily laden container is one that is loaded to within 20 percent of its rated capacity.

(iii) Lifting containers by fork lift trucks or by grappling arms from above or from one side may be done only if the container is designed for this type of handling.

(iv) Other means of hoisting may be used only if the containers and hoisting means are designed for such use.

(2)(i) When using intermodal container spreaders that employ lanyards for activation of load disengagement, all possible precautions shall be taken to prevent accidental release of the load.

(ii) Intermodal container spreader twistlock systems shall be designed and used so that a suspended load cannot accidentally be released.

(3) Flat bed trucks or container chassis used to move intermodal containers shall be equipped with pins, flanges, or other means to prevent the container from shifting.

(4) After July 27, 1998, flat bed, low boy trailers (mafis) and other similar equipment used to transport containers shall be marked with their cargo capacities and shall not be overloaded.

(5) Each tractor shall have all brake air lines connected when pulling trailers equipped with air brakes and shall have the brakes tested before commencing operations.

(g)(1) Intermodal containers shall be inspected for defects in structural members or fittings before handling.

(2) Any intermodal container found to be unsafe shall be identified as such, promptly removed from service and repaired before being returned to service.

(h) Containers shall not be hoisted unless all engaged chassis twist locks are released.

§1917.73—Terminal facilities handling menhaden and similar species of fish (See also 1917.2, Hazardous cargo, material, substance, or atmosphere).

(a)(1) Tanks in terminal areas used for receiving or storing bailwater for recirculating into vessels' holds in discharging operations shall be opened or ventilated to minimize contamination of water circulated to the vessels. Bailwater tanks shall be thoroughly drained upon completion of each day's operations and shall be left open to the air. Drainage is unnecessary when bailwater has been treated to remove hydrogen sulfide-producing contaminants and the efficiency of such treatment has been established by the employer.

(2) Before employees enter a dock tank, it shall first be drained, rinsed and tested for hydrogen sulfide and oxygen deficiency. Employees shall not enter the tank when the hydrogen sulfide level exceeds 20 ppm or oxygen content is less than 19.5 percent, except in emergencies.

(3) Tests shall be conducted by designated personnel with suitable test equipment and respiratory protective equipment complying with the provisions of §1910.134 of this chapter.

(b) Pipelines and hoses on the dock or terminal used for receiving and circulating used bailwater shall be completely drained upon completion of each day's operation and left open to the air.

(c) At least four units of respiratory protective equipment consisting of supplied-air respirators or self-contained breathing apparatus complying with the requirements of §1910.134 of this chapter shall be available in a suitably labeled cabinet for immediate use in case of emergency caused by oxygen deficiency or hydrogen sulfide. Any employee entering a tank in an emergency shall, in addition to respiratory protective equipment, wear a lifeline and safety harness to facilitate rescue. At least two other employees, similarly equipped, shall be continuously stationed outside the tank to observe and to provide rescue services.

(d) The plant superintendent and foremen shall be trained and knowledgeable about the hazards of hydrogen sulfide and oxygen deficiency. They shall be trained in the use of appropriate respiratory and other protective equipment, and in rescue procedures. Other supervisory plant personnel shall be informed of these hazards and instructed in the necessary safety measures, including use of respiratory and rescue equipment.

(e) Supervisory personnel shall be on hand at dockside to supervise discharging of ballwater from vessels.

Subpart E—Personal Protection

§1917.91—Eye and face protection.

(a)(1) The employer shall ensure that each affected employee uses appropriate eye and/or face protection where there are exposures to eye and/or face hazards. Such equipment shall comply with American National Standards Institute, ANSI Z-87.1-1989, “Practices for Occupational and Educational Eye and Face Protection.”

(2) For employees wearing corrective spectacles, eye protection equipment required by paragraph (a)(1) of this section must be of a type which can be worn over spectacles. Prescription ground safety lenses may be substituted if they provide equivalent protection.

(3) For additional requirements covering eye protection against radiant energy, see §1917.152(h).

(b) Eye protection equipment shall be maintained in good condition.

(c) Used eye protection equipment shall be cleaned and disinfected before reissuance to another employee.

§1917.92—Respiratory protection.

(See §1917.1(a)(2)(x)).

§1917.93—Head protection.

(a) The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects.

(b) Such equipment shall comply with American National Standards Institute, ANSI Z-89.1-1986, “Personnel Protection—Protective Headwear for Industrial Workers-Requirements.”

(c) Protective hats previously worn shall be cleaned and disinfected before issuance by the employer to another employee.

§1917.94—Foot protection.

(a) The employer shall ensure that each affected employee wears protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole.

(b) Such equipment shall comply with American National Standards Institute, ANSI Z-41-1991, “American National Standard for Personal Protection-Protective Footwear.”

§1917.95—Other protective measures.

(a) *Protective clothing.* (1) Employees performing work that requires special protective clothing shall be directed by the employer to wear the necessary special protective clothing.

(2) When necessary, protective clothing previously worn shall be cleaned and disinfected before reissuance.

(b)(1) *Personal Flotation Devices (PFDs).* (1) The employer shall provide, and shall direct the wearing of PFDs for those employees, such as line handlers, who are engaged in work in which they may be pulled into the water:

- (i) When such employees are working in isolation, or
 - (ii) Where physical limitations of available working space creates a hazard of falling into the water, or
 - (iii) Where the work area is obstructed by cargo or other obstacles so as to prevent employees from obtaining safe footing for their work.
- (2) PFDs (life preservers, life jackets, and work vests) worn by each affected employee must be United States Coast Guard (USCG) approved pursuant to 46 CFR part 160 (Type I, II, III, or V PFD) and marked for use as a work vest, for commercial use, or for use on vessels.
- (3) Personal flotation devices shall be maintained in safe condition and shall be considered unserviceable when damaged so as to affect buoyancy or fastening capability.
- (c) *Emergency facilities.* When employees are exposed to hazardous substances which may require emergency bathing, eye washing or other facilities, the employer shall provide such facilities and maintain them in good working order.

Subpart F—Terminal Facilities

§1917.111—Maintenance and load limits.

- (a) The structural integrity of docks, piers, wharves, terminals, and working surfaces shall be maintained.
- (b) Maximum safe load limits, in pounds per square foot (kilograms per square meter), of floors elevated above ground level, and pier structures over the water shall be conspicuously posted in all cargo areas.
- (c) Maximum safe load limits shall not be exceeded.
- (d) All walking and working surfaces in the terminal area shall be maintained in good repair.

§1917.112—Guarding of edges.

(a) Vehicle protection. **(1)** Vehicle curbs, bull rails, or other effective barriers at least six inches (15.24 cm) in height shall be provided at the waterside edges of aprons and bulkheads, except where vehicles are prohibited. Curbs or bull rails installed after October 3, 1983, shall be at least 10 inches (25.4 cm) in height.

(2) The provisions of paragraph **(a)(1)** of this section also apply at the edge of any fixed level above the common floor area from which vehicles may fall, except at loading docks, platforms and skids where cargo is moved by vehicles.

(b) Employee protection. **(1)** Guardrails shall be provided at locations where employees are exposed to floor or wall openings or waterside edges, including bridges or gangway-like structures leading to pilings or vessel mooring or berthing installations, which present a hazard of falling more than 4 feet (1.22 m) or into the water, except as specified in paragraph **(b)(2)** of this section.

(2) Guardrails are not required:

(i) At loading platforms and docks;

(ii) At waterside edges used for cargo handling;

(iii) On the working sides of work platforms, skids or similar workplaces; or

(iv) On railroad rolling stock, highway vehicles, intermodal containers, or similar equipment.

(3) Where guardrails are impracticable due to machinery requirements or work processes, an alternate means of protecting employees from falling, such as nets, shall be used.

(c) Criteria for guardrails. Guardrails shall meet the following criteria:

(1) They shall be capable of withstanding a force of at least 200 pounds (890 N) applied in any direction at mid-span of the top rail (when used), or at the uppermost point if there is no top rail.

(2) If not of solid baluster, grillwork, slatted, or similar construction, guardrails shall consist of top rails and midrails. Midrails, when used, shall be positioned at approximately half the height of the top rail.

(3) The top surface of guardrails installed before October 3, 1983, shall be at least 36 inches (0.91 m) high. Those installed after October 3, 1983, shall be 42 inches (1.07 m) plus or minus 2 inches (5.1 cm), high.

(4) Any non-rigid railing such as chain or wire rope shall have a maximum sag limit at the mid-point between posts of not more than 6 inches (15.24 cm).

(5) Top rails shall be free of puncture and laceration hazards.

(6) Rail ends shall not overhang to constitute a hazard, but this does not prohibit scrollwork, boxed ends or similar non-hazardous projections.

(d) *Toeboards.* Toeboards shall be provided when employees below could be exposed to falling objects such as tools. Toeboards shall be at least 3 1/2 inches (8.9 cm) in height from top edge to floor level, and be capable of withstanding a force of 50 pounds (222 N) applied in any direction. Drainage clearance under toeboards is permitted.

(e) *Stair railings.* Stair railings shall be capable of withstanding a force of at least 200 pounds (890 N) applied in any direction, and shall not be more than 36 inches (0.91 m) nor less than 32 inches (0.81 m) in height from the upper top rail surface to the tread surface in line with the leading edge of the tread.

Railings and midrails shall be provided at any stairway having four or more risers, as follows:

- (1) For stairways less than 44 inches (1.12 m) wide, at least one railing; and
 - (2) For stairways more than 44 inches (1.12 m) but less than 88 inches (2.24 m) wide, a stair rail or handrail on each side, and if 88 inches (2.24 m) or more wide, an additional intermediate handrail.
- (f) *Condition.* Railings shall be maintained free of sharp edges and in good repair.

§1917.113—Clearance heights.

Clearance heights shall be prominently posted where the height is insufficient for vehicles and equipment.

§1917.114—Cargo doors.

(a) *Mechanically operated.* (1) Cargo door counterweights shall be guarded.

(2) Lift trucks and cranes shall not be used to move mechanically operated doors except when necessary during repair on the doors, in which case ropes or other guarding shall be provided to prevent entry into the area where the door may fall or slide.

(3) Vertically operated doors partially opened for work or ventilation shall be secured to prevent accidental closing.

(b) *Tackle operated.* (1) The door shall be connected to its lifting tackle with shackles or equally secure means.

(2) Lifting bridles and tackles shall have a safety factor of five, based upon maximum anticipated static loading conditions.

(3) Devices shall be provided to hold overhead doors in the open position and to secure them when closed.

(4) Lifting gear and hardware shall be maintained in safe condition.

(5) Lifting ropes, when used, shall be placed out of the work area and off the floor.

(c) *Horizontal sliding.* (1) Horizontal sliding door rollers shall be constructed to prevent the door from jumping from overhead tracks.

(2) Sliding doors shall be secured to prevent them from swinging.

§1917.115—Platforms and skids.

(a) Platforms and skids extending from piers, transit sheds, or lofts and used for landing or hooking on drafts shall be provided at the open sides with guardrails meeting the requirements of 1917.112(c) or alternate means, such as nets, to protect employees against falls.

(b) Any employee working below a second-story platform or skid shall be protected from falling objects by a net stretched from the platform or skid to the vessel.

(c) Platforms and skids shall be strong enough to bear the loads handled and shall be maintained in safe condition. Safe working loads, which shall be posted or marked on or adjacent to platforms and skids, shall have a minimum safety factor of five for any part, based upon maximum anticipated static loading conditions and the ultimate strength of the construction material.

(d) The employer shall provide and maintain platform and skid attachments that will prevent accidental movement of the skid or platform.

§1917.116—Elevators and escalators.

(a) “Elevator” means a permanent hoisting and lowering mechanism with a car or platform moving vertically in guides and serving

two or more floors of a structure. The term excludes such devices as conveyors, tiering, or piling machines, material hoists, skip or furnace hoists, wharf ramps, lift bridges, car lifts, and dumpers.

(b) “Escalator” means a power-driven continuous moving stairway principally intended for the use of persons.

(c) No elevator or escalator with a defect which affects safety shall be used.

(d) Elevator safety devices shall not be overridden or made inoperable.

(e) Elevators and escalators shall be thoroughly inspected at intervals not exceeding one year. Additional monthly inspections for satisfactory operation shall be conducted by designated persons. Records of the results of the latest annual elevator inspections shall be posted in elevators. Records of annual escalator inspections shall be posted in the vicinity of the escalator or be available at the terminal.

(f) Elevator landing openings shall be provided with doors, gates or equivalent protection which shall be in place when the elevator is not at that landing, to prevent employees from falling into the shaft.

(g) The elevator’s or escalator’s maximum load limits shall be posted and not exceeded. Elevator load limits shall be posted conspicuously both inside and outside of the car.

(h) Elevators shall be operated only by designated persons except for automatic or door interlocking elevators which provide full shaft door closing and automatic car leveling.

§1917.117—Manlifts.

(a) *Inspection.* Manlifts shall be inspected monthly by a designated person. Safety switches shall be checked weekly. Manlifts found to be unsafe shall not be operated until repaired. Inspections shall include at least the following:

- (1)** Step fastenings;
- (2)** Rails;
- (3)** Rail supports and fastenings;
- (4)** Roller(s) and slides;
- (5)** Belt(s) and belt(s) tension;
- (6)** Handholds and fastenings;
- (7)** Floor landings;
- (8)** Guardrails;
- (9)** Lubrication;
- (10)** Safety switches;
- (11)** Warning signs and lights;
- (12)** Illumination;
- (13)** Drive pulley;
- (14)** Bottom (boot) pulley and clearance;
- (15)** Pulley supports;
- (16)** Motor;
- (17)** Drive mechanism;
- (18)** Brake;
- (19)** Electrical switches;
- (20)** Vibration and misalignment;

(21) “Skip” on up or down run when mounting the step (indicating worn gears); and

(22) Emergency exit ladders.

(b) *Inspection records.* Inspection records shall be kept for at least one year. The record of the most recent inspection shall be posted in the vicinity of the manlift or in the terminal.

(c) *Emergency stop.* An emergency stop device shall be available within easy reach from any position on the belt.

(d) *Instructions.* Manlift use instructions shall be conspicuously posted.

(e) *Top floor warning sign and light.* An illuminated sign and red light that are visible to the user shall be provided under the top floor opening of the manlift to warn the user to get off at that floor.

(f) *Bottom floor warning sign.* A sign visible to descending passengers shall be provided to warn them to get off at the bottom floor.

(g) *Upper limit stop.* An automatic stop device shall be provided to stop the manlift when a loaded step passes the top landing, except that manlifts installed after October 3, 1983 shall have two such devices.

(h) *Handholds and steps.* Each step shall be provided with a corresponding handhold.

(i) *Emergency ladder.* A fixed emergency ladder accessible from any position on the lift and in accordance with the requirements of §1917.118(d) shall be provided for the entire run of the manlift.

(j) *Landings.* (1) Clear and unobstructed landing spaces shall be provided at each level. Manlifts constructed after October 3, 1983 and that have a distance of 50 feet (15.24 m) or more between floor landings shall have an emergency landing every 25 feet (7.62 m) or less of manlift travel.

(2) Open sides of emergency landings shall be protected by guardrails.

(3) Floor landing entrances and exits shall be guarded by mazes, self-closing gates, or equivalent devices.

(4) Landings shall be of sufficient size and strength to support 250 pounds (1,112 N).

(k) *Floor opening guards.* The ascending sides of manlift floor openings shall be provided with cones or bevel guards to direct the user through the openings.

(l) *Maintenance.* Manlifts shall be equipped, maintained, and used in accordance with the manufacturer's specifications, which shall be available at the terminal.

(m) *Bottom pulley.* (1) The lower pulley shall be supported by the lowest landing.

(2) Sides of the bottom pulley support shall be guarded to prevent contact with the pulley or the steps.

(n) *Top clearance.* A clearance of at least 11 feet (3.35 m) shall be provided between the top landing and the ceiling.

(o) *Brakes.* Manlifts shall be equipped with brakes that are:

(1) Self-engaging;

(2) Electrically released; and

(3) Capable of stopping and holding the manlift when the descending side is loaded with the maximum rated load.

§1917.118—Fixed ladders.

(a) *Scope and applicability.* This section applies to all fixed ladders except:

(1) Ladders forming an integral part of railway cars, highway carriers, cargo containers or other transportation carrier equipment;

(2) Climbing devices such as step bolts or structural members of tanks and towers;

(3) Ladders built into or vertically attached to tubular scaffold framing; and

(4) Ladders used only for fire-fighting or emergency purposes.

(b) Definitions. (1) “Cage” (basket guard) means a barrier enclosing or nearly enclosing a ladder’s climbing space and fastened to one or both of the ladder’s side rails or to another structure.

(2) “Fixed ladder” means a ladder including individual rung ladders, permanently attached to a structure, building, or piece of equipment.

(3) “Ladder safety device” means a support system limiting an employee’s drop or fall from the ladder, and which may incorporate friction brakes, lifelines, and lanyards, or sliding attachments.

(4) “Well” means a permanent complete enclosure around a fixed ladder, which is attached to the walls of the well.

(c) Defects. (1) Ladders with broken, split or missing rungs, steps or rails, broken welds or connections, corrosion, or wastage or other defect which may affect safe use shall be removed from service.

(2) Ladder repairs shall provide strength at least equivalent to that of the original ladder.

(d) Ladder specifications. (1)(i) Ladders installed before October 3, 1983, shall be capable of withstanding without damage a minimum concentrated load, applied uniformly over a 3 1/2 inch (8.9 cm) width at the rung center, of 200 pounds (890 N).

(ii) Ladders installed after October 3, 1983 shall be capable of withstanding 250 pounds (1,112 N) applied as described in paragraph (d)(1)(i) of this section. If used by more than one employee simultaneously, the ladder as a unit shall be capable of simultaneous additional loading in 250 pound (1,112 N) increments for each additional employee, applied to a corresponding number of rungs. The unit shall have a safety factor of four, based on ultimate strength, in the designed service.

(2)(i) Ladders installed before October 3, 1983, shall have rungs evenly spaced from nine inches (22.9 cm) to 16 1/2 inches (41.9 cm) apart, center to center.

(ii) Ladders installed after October 3, 1983 shall have rungs evenly spaced from 12 inches (30.5 cm) \pm 2 inches (5.08 cm) apart, center to center.

(3)(i) Ladders installed before October 3, 1983 shall have a width between side rails of at least 10 inches (25.4 cm).

(ii) Ladders installed after October 3, 1983 shall have a width between side rails of at least 12 inches (30.48 cm).

(4) The minimum distance between the rung center line and the nearest permanent object behind the rung shall be 4 inches (10.16 cm), except that in ladders installed after October 3, 1983, the minimum distance shall be 7 inches (17.78 cm) unless physical limitations make a lesser distance, not less than 4 1/2 inches (11.43 cm), necessary.

(5) When a ladder passes through an opening or past overhead obstructions, a minimum 24 inch (0.61 m) clearance shall exist between the climbing side and any obstruction. Where this distance is less than 30 inches (0.76 m), a deflection device shall be installed for guidance through the opening.

(6) The side rails of ladders shall extend at least 36 inches (0.91 m) above the top landing surface, unless grab bars or equivalent holds are provided.

(7) Ladders whose pitch exceeds 90 degrees to the horizontal (slanting backward on the climbing side) shall not be used.

(e) Protection against falls. (1) Fixed ladders more than 20 feet (6.1 m) in height shall be provided with a cage, well, or ladder safety device.

(2) When a well or cage is used, ladders with length of climb exceeding 30 feet (9.14 m) shall comply with the following provisions:

(i) The ladder shall consist of multiple sections not exceeding 30 feet (9.14 m) each;

(ii) Each section shall be horizontally offset from adjacent sections, except as specified in paragraph (e)(2)(iv) of this section;

(iii) A landing platform capable of supporting a load of 100 pounds per square foot (4.79 kPa) and fitted with guardrails complying with §1917.112(c) shall be provided at least every 30 feet (9.14 m), except as specified in paragraph (e)(2)(iv) of this section.

(iv) For ladders installed after October 3, 1983, offset sections and landing platforms are not required if hinged platforms capable of supporting 100 pounds per square foot (4.79 kPa), and which are kept closed except when opened for passage, are within the cage or well at intervals not exceeding 30 feet (9.14 m).

(3) Ladders equipped with ladder safety devices shall have rest platforms:

(i) Capable of supporting a load of 100 pounds per square foot (4.79 kPa);

(ii) Located at intervals of 150 feet (45.7 m) or less; and

(iii) Protected by guardrails complying with §1917.112(c) on three sides.

(4) Where used, ladder safety devices shall:

- (i)** Be installed and maintained in accordance with the manufacturer's instructions, which shall be available for inspection;
- (ii)** Be repaired only with replacement parts having performance capability at least equal to that of the original parts;
- (iii)** Have a connection length between carrier centerlines and safety belts of 10 + or - 2 inches (25.4 + or - 5.08 cm); and
- (iv)** Be installed in a manner that does not reduce the ladder's structural capability.

(5) Ladder cages or wells shall:

- (i)** Be of rigid construction that allows unobstructed use but prevents an employee from falling through or dislodging the cage or well by falling against it;
- (ii)** Have smooth inner surfaces;
- (iii)** Extend at least 36 inches (0.91 m) above landings; and
- (iv)** Extend to within 8 feet (2.44 m) above the ground or base, except that a maximum of 20 feet (6.1 m) is permitted where the cage or well would extend into traffic lanes.

(6) Ladders installed after (effective date of standard) on radio, microwave communications, electrical power and similar towers, poles and structures, including stacks and chimneys, shall meet the requirements of paragraph (e).

(f) *Individual rung ladders.* Ladders consisting of individual rungs that are attached to walls, conical manhole sections, or river cells shall:

- (1)** Be capable of supporting a load of 350 pounds (1557 N) without deformation;

(2) Form a continuous ladder, uniformly spaced vertically from 12 inches (30.5 cm) to 16 inches (40.6 cm) apart, with a minimum width of 10 inches (25.4 cm) and projecting at least 4 1/2 inches (11.43 cm) from the wall;

(3) Be so constructed that an employee's foot cannot slide off the ends; and

(4) Be firmly attached and without sharp edges.

§1917.119—Portable ladders.

(a) *Scope and applicability.* This section applies to all portable ladders, including job-made ladders for temporary use, unless otherwise specified.

(b) *Standards for existing manufactured portable ladders.* (1) Rungs of manufactured portable ladders obtained before October 3, 1983, shall be capable of supporting a 200-pound (890 N) load without deformation.

(2) Rungs shall be evenly spaced from 9 inches (22.9 cm) to 16 1/2 inches (41.9 cm), center to center.

(3) Rungs shall be continuous members between rails. Each rung of a double-rung ladder (two side rails and a center rail) shall extend the full width of the ladder.

(4) Width between side rails at the base of the ladder shall be at least 12 inches (30.48 cm) for ladders 10 feet (3.05 m) or less in overall length, and shall increase at least 1/4 inch (0.64 cm) for each additional 2 feet (0.61 m) of ladder length.

(c) *Standards for manufactured portable ladders.* Portable manufactured ladders obtained after January 21, 1998 shall bear identification indicating that they meet the appropriate ladder construction requirements of the following standards:

ANSI A14.1-1990 Safety Requirements for Portable Wood Ladders
ANSI A14.2-1990 Safety Requirements for Portable Metal Ladders
ANSI A14.5-1992 Safety Requirements for Portable Reinforced Plastic Ladders

(d) *Standards for job-made portable ladders.* Job-made ladders shall:

- (1)** Have a minimum and uniform distance between rungs of 12 inches (30.48 cm), center to center;
- (2)** Are capable of supporting a 250-pound (1,112 N) load without deformation; and
- (3)** Have a minimum width between side rails of 12 inches (30.48 cm) for ladders 10 feet (3.05 m) in height. Width between rails shall increase at least 1/4 inch (0.64 cm) for each additional 2 feet (0.61 m) of ladder length.

(e) *Maintenance and inspection.* **(1)** The employer shall maintain portable ladders in safe condition. Ladders with the following defects shall not be used and either shall be tagged as unusable if kept on the premises or shall be removed from the worksite:

- (i)** Broken, split or missing rungs, cleats or steps;
- (ii)** Broken or split side rails;
- (iii)** Missing or loose bolts, rivets or fastenings;
- (iv)** Defective ropes; or
- (v)** Any other structural defect.

(2) Ladders shall be inspected for defects prior to each day's use, and after any occurrence, such as a fall, which could damage the ladder.

(f) Ladder usage. (1) Ladders made by fastening rungs or devices across a single rail are prohibited.

(2) Ladders shall not be used:

(i) As guys, braces, or skids; or

(ii) As platforms, runways, or scaffolds.

(3) Metal and wire-reinforced ladders with wooden side rails shall not be used when employees on the ladder might come into contact with energized electrical conductors.

(4) Individual sections from different multi-sectional ladders or two or more single straight ladders shall not be tied or fastened together to achieve additional length.

(5) Except for combination ladders, self-supporting ladders shall not be used as single straight ladders.

(6) Unless intended for cantilever operation, non-self-supporting ladders shall not be used to climb above the top support point.

(7) Ladders shall extend at least 36 inches (0.91 m) above the upper support level if employees are to leave or mount the ladder at that level, except that where such extension is impractical other equivalent means such as grab bars may be used to provide a hand grip.

(8) Ladders shall be securely positioned on a level and firm base.

(9) Ladders shall be fitted with slip-resistant bases and secured at top or bottom to prevent the ladder from slipping.

(10) The employer shall direct that ladders shall be placed so that employees climbing are not exposed to injury from projecting objects or doors that open toward the ladder.

§1917.120—Fixed stairways.

(a) Definition. “Fixed stairway” means interior and exterior stairs serving machinery, tanks and equipment, and stairs to or from floors, platforms or pits. The term does not apply to stairs intended only for fire exit purposes, to articulated stairs (the angle of which changes with the rise and fall of the base support) or to stairs forming an integral part of machinery.

(b) New Installations. (1) Fixed stairs installed after October 3, 1983 shall be positioned within the range of 30 degrees to 50 degrees to the horizontal with uniform riser height and tread width throughout each run and be capable of a minimum loading of 100 pounds per square foot (445 N) and a minimum concentrated load of 300 pounds (1,334 N) at the center of any treadspan. Riser height shall be from 6 inches (15.24 cm) to 7.5 inches (19.05 cm), stair width a minimum of 22 inches (55.88 cm) between vertical barriers, tread depth a minimum of 12 inches (30.48 cm) plus or minus 2 inches (5.08 cm), and tread nosing shall be straight leading edges.

(2) Stair landings shall be at least 20 inches (50.8 cm) in depth. Where doors or gates open on a stairway, a landing platform shall be provided. Door swing shall not reduce effective standing area on the landing to less than 18 inches (45.72 cm) in depth.

(3) Fixed stairs having four or more risers shall have stair railings or handrails complying with §1917.112(c)(1).

(4) Railing height from tread surface at the riser face shall be 33 inches (83.82 cm) plus or minus 3 inches (7.62 cm).

(5) Restricted areas. When physical features require stairs steeper than those provided for by paragraph **(b)(1)** of this section, stairs at angles of 50 degree to 75 degrees from the horizontal may be used if they:

(i) Are capable of a single concentrated load of 200 pounds (890 N) at the tread centers;

(ii) Have open treads at least 4 inches (10.16 cm) in depth and 18 inches (45.72 cm) in width with a uniformly spaced vertical rise between treads of 6 inches (15.24 cm) to 9.5 inches (24.13 cm); and

(iii) Have handrails that meet the requirements of §1917.112(c)(1) on both sides and that are not less than 30 inches (76.2 cm) in height from the tread surface at the riser face.

(6) Maintenance. Fixed stairways shall be maintained in safe condition and shall not be obstructed.

§1917.121—Spiral stairways.

(a) *Definition.* “Spiral stairway” means one with closed circular form, uniform sector-shaped treads, and a supporting column.

(b) *Requirements.* Spiral stairways shall meet the following requirements:

(1) Stairways shall conform to the minimum dimensions of Figure F-1;

(2) Stairway risers shall be uniform and shall range from 6 1/2 inches (16.5 cm) to 10 1/2 inches (26.67 cm) in height;

FIGURE F-1
SPIRAL STAIRWAY - MINIMUM DIMENSIONS

A (half-tread Width)	B	
Normal use by employees	11 inches (27.94 cm)	6 inches (15.24 cm)
Limited access	9 inches (22.86 cm)	5 inches (12.7 cm).

(3) Minimum loading capability shall be 100 pounds per square foot (4.79 kN), and minimum tread center concentrated loading shall be 300 pounds (1334 N);

(4) Railings shall conform to the requirements of §1917.112(c)(1). If balusters are used, there shall be a minimum of one per tread. Handrails shall be a minimum of 1 1/4 inches (3.18 cm) in outside diameter; and

(5) Vertical clearance shall be at least 6 feet, 6 inches (1.98 m) above the top step.

(c) *Maintenance.* Spiral stairways shall be maintained in safe condition.

§1917.122—Employee exits.

(a) Employee exits shall be clearly marked.

(b) If an employee exit is not visible from employees work stations, directional signs indicating routes to the exit shall be posted.

(c) Exits shall be readily accessible and sufficient in number to provide employees with a convenient means of escape in emergencies. A clear passage to the exit shall be maintained.

(d) The minimum width of any employee exit shall be 28 inches (71.12 cm).

§1917.123—Illumination.⁹

(a) Working and walking areas shall be illuminated. Unless conditions described in the regulations of the United States Coast Guard (33 CFR 126.15(1) and (n), and 33 CFR 154.570) exist in the case of specific operations, illumination in active work areas

⁹The United States Coast Guard, at 33 CFR 126.15(l) and (n), and 33 CFR 154.570 sets out requirements for illumination at “designated waterfront facilities” and “large oil transfer facilities.”

(for example, cargo transfer points) shall be of an average minimum light intensity of 5 foot-candles. The illumination in other work areas (for example, farm areas) shall be of an average minimum light intensity of 1 foot-candle except for security purposes when a minimum light intensity of $\frac{1}{2}$ foot-candle shall be maintained. Where occasional work tasks require more light than that which is consistently and permanently provided, supplemental lighting shall be used.

(b) The lighting intensity shall be measured at the task/working surface in the plane in which the task/working surface is present.

(c) Lights shall, so far as possible, be placed so that they will not shine in the eyes of employees.

§1917.124—Dockboards (car and bridge plates).

(a) *General.* The employer shall provide safe means of passage between different surface levels and across openings

(b) *(Reserved)*

(c) *Dockboards (car and bridge plates).* (1) Dockboards shall be strong enough to support the loads imposed on them.

(2) Portable dockboards shall be anchored in position or be equipped with devices to prevent their movement.

(3) Hand holds or other effective means shall be provided on portable dockboards to permit safe handling.

(4) Positive means shall be used to prevent railcars or highway vehicles from being moved while dockboards or bridge plates are in position.

(5) Be designed, constructed, and maintained to prevent vehicles from running off the edge.¹⁰

(6) Dockboards shall be well maintained.

(d) *Ramps.* (1) Ramps shall be strong enough to support the loads imposed on them and be designed, constructed, and maintained to prevent vehicles from running off the edge.¹¹

(2) Ramps shall be equipped with a guardrail meeting the requirement of §1917.112(c)(1) if the slope is more than 20 degrees to the horizontal or if employees could fall more than 4 feet (1.22 m).

(3) Ramps shall have slip-resistant surfaces.

(4) When necessary to prevent displacement by vehicle wheels, steel plates or similar devices used to temporarily bridge or cover uneven surfaces or tracks, shall be anchored.

(5) Ramps shall be well maintained.

§1917.125—Guarding temporary hazards.

Ditches, pits, excavations, and surfaces in poor repair shall be guarded by readily visible barricades, rails, or other equally effective means.

§1917.126—River banks.

(a) This section applies to temporary installations or temporary operations near a river bank.

¹⁰When the gap to be bridged is greater than 36 inches (.91 mm), an acceptable means of preventing vehicles from running off the edge is a minimum side board height of two and three-quarter inches (6.9 cm).

¹¹When the gap to be bridged is greater than 36 inches (.91 mm), an acceptable means of preventing vehicles from running off the edge is a minimum side board height of two and three-quarter inches (6.9 cm).

(b) Where working surfaces at river banks slope so steeply that an employee could slip or fall into the water, the outer perimeter of the working surface shall be protected by posting or other portable protection such as roping off. In these situations, employees must wear a personal flotation device meeting the requirements of §1917.95(b).

§1917.127—Sanitation.

(a) *Washing and toilet facilities.* **(1)** The employer shall provide accessible washing and toilet facilities sufficient for the sanitary requirements of employees. The facilities shall have:

(i) Running water, including hot and cold or tepid water at a minimum of one accessible location (when cargo handling is conducted at locations without permanent facilities, potable water may be provided in lieu of running water);

(ii) Soap;

(iii) Individual hand towels, clean individual sections of continuous toweling or warm air blowers; and

(iv) Fixed or portable toilets in separate compartments with latch-equipped doors. Separate toilet facilities shall be provided for male and female employees except when toilet rooms will be occupied by only one person at a time.

(2) Washing and toilet facilities shall be regularly cleaned and maintained in good order.

(b) *Drinking water.* **(1)** Potable drinking water shall be accessible to employees at all times.

(2) Potable drinking water containers shall be clean, containing only water and ice, and shall be fitted with covers.

(3) Common drinking cups are prohibited.

(c) *Prohibited eating areas.* Consumption of food or beverages in areas where hazardous materials are being stored or handled shall be prohibited.

(d) *Garbage and overboard discharges.* Work shall not be conducted in the immediate vicinity of uncovered garbage or in the way of overboard discharges from the vessel's sanitary lines unless employees are protected from the garbage or discharge by a baffle or splash boards.

§1917.128—Signs and markings.

(a) *General.* Signs required by this part shall be clearly worded and legible, and shall contain a key word or legend indicating the reason for the sign.

(1) Key words are such words as Danger, Warning, Caution.

(2) Legends are more specific explanations such as High Voltage, Close Clearance, Pedestrian Crossing.

(b) *Specific.* Every marine terminal shall have conspicuously posted signs as follows:

(1) Locations of first-aid facilities;

(2) Locations of telephones;

(3) Telephone numbers of the closest ambulance service, hospital or other source of medical attention, police, fire department, and emergency squad (if any); and

(4) Locations of firefighting and emergency equipment and fire exits.

Subpart G—Related Terminal Operations and Equipment

§1917.151—Machine guarding.

(a) Definition. “Guarded” means shielded, fenced, or enclosed by covers, casings, shields, troughs, spillways, or railings, or guarded by position or location. Examples of guarding methods are guarding by location (positioning hazards so they are inaccessible to employees) and point of operation guarding (using barrier guards, two-hand tripping devices, electronic safety devices, or other such devices).

(b) General. (1) Danger zones on machines and equipment used by employees shall be guarded.

(2) Where chips and dust produced by machine operation may result in a hazard to the operator, the machinery shall be equipped with an effective exhaust system at the point of origin, or other equally effective means shall be provided to protect the operator.

(3) Fixed machinery shall be secured to prevent shifting.

(4) A power cut-off device for machinery and equipment shall be provided at the operator’s working position.

(5) Machines driven by belts and shafting shall be fitted with a beltlocking or equivalent protective device if the belt can be shifted.

(6) In operations where injury to the operator might result if motors were to restart after power failures, provisions shall be made to prevent machines from automatically restarting upon restoration of power.

(7) The power supply to machines shall be turned off, locked out, and tagged out during repair, adjustment, or servicing.

(8) Machines shall be maintained in a safe working condition.

(9) Only designated employees shall maintain or repair machinery and equipment.

(10) Machines with defects that affect the safety of operation shall not be used.

(c) *Hand-fed circular rip saws and hand-fed circular crosscut table saws.* Unless fixed or manually adjustable enclosures or guarding provides equivalent protection, hand-fed circular rip saws and hand-fed circular crosscut table saws shall be guarded as follows to keep employees clear of any danger zones:

(1) They shall be equipped with hoods completely enclosing those portions of the saw above the table and the material being cut;

(2) They shall have spreaders to prevent material from squeezing the saw. Spreaders shall be in true alignment with the saw. Spreaders may be removed only during grooving, dadoing, or rabbeting operations, and shall be replaced at the completion of such operations; and

(3) They shall have non-kickback fingers or dogs to oppose the tendency of the saw to pick up material or throw material toward the operator.

(d) *Swing cutoff saws.* **(1)** Swing cut-off saws shall have hoods completely enclosing the upper half of the saw, the arbor end and the point of operation at all saw positions to protect the operator from material thrown up by the saw. The hood shall automatically cover the lower portion of the blade, so that when the saw returns to the back of the table the hood rises on top of the fence, and when the saw is moved forward the hood drops on top, remaining in contact with the table or the material.

(2) Swing cutoff saws shall have a device to return the saw automatically to the back of the table without rebound. The device shall not be dependent upon rope, cord, or springs.

(3) Devices shall be provided to prevent saws from swinging beyond the front or back edges of the table.

(4) Inverted swing cutoff saws shall have hoods covering the part of the saw protruding above the table top or material being cut. Hoods shall automatically adjust to the thickness of, and remain in contact with, material being cut.

(e) *Radial saws.* Unless fixed or manually adjustable enclosures or guards provide equivalent protection, radial saws shall be guarded as follows:

(1) The upper hood of radial saws shall enclose the upper portion of the blade up to and including the end of the saw arbor and shall protect the operator from being struck by debris. The sides of the lower exposed portion of the blade shall be guarded to the blade diameter by a device automatically adjusting to the thickness of the stock and remaining in contact with the stock. The lower guard may be removed only when the saw is used for bevel cuts;

(2) Radial saws used for ripping shall have non-kickback fingers or dogs on both sides to oppose the thrust or tendency of the saw to pick up material or throw material toward the operator;

(3) Adjustable stops shall be provided to prevent travel of radial saw blades beyond the table's edge;

(4) Radial saws shall be installed so that the cutting head returns to the starting position without rebound when released; and

(5) The employer shall direct that employees perform ripping and ploughing against the saw turning direction. Rotation direction and an indication of the end of the saw to be used shall be conspicuously marked on the hood.

(f) Band saws and band resaws. (1) Saw blades and band saw wheels shall be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table, to protect employees from point-of-operation hazards and flying debris.

(2) Band saws shall be equipped with brakes to stop the band saw wheel if the blade breaks.

(3) Band saws shall be equipped with a tension control device to keep the blade taut.

(g) Abrasive wheels and machinery. (1) Abrasive wheels shall be used only on machines having enclosure guards to restrain pieces of grinding wheels and to protect employees if the wheel breaks, except as provided in paragraphs **(g)(2)** and **(g)(3)** of this section. Where the operator must stand in front of the safety guard opening, the safety guard shall be adjustable or have an adjustable tongue or piece at the top of the opening. The safety guard or the tongue shall be adjusted so that they are always close to the periphery of the wheel. Guards shall be aligned with the wheel and the strength of fastenings shall be greater than the strength of the guard.

(2) When the work provides equivalent protection, or when the machine is designed as a portable saw, guards may be constructed with the spindle end, nut, and outer flange exposed. When the work entirely covers the side of the wheel, the side covers of the guard may be removed.

(3) Guarding is not required:

(i) For wheels used for internal work while the wheel is contained within the work being ground; or

(ii) For mounted wheels 2 inches (5 cm) and smaller in diameter used in portable operation.

(4) Work rests shall be used on fixed grinding machines. Work rests shall be rigidly constructed and adjustable for wheel wear. They shall be adjusted closely to the wheel with a maximum opening of 1/8-inch (3.18 mm) and shall be securely clamped. Adjustment shall not be made while the wheel is in motion.

(5) Grinding wheels shall fit freely on the spindle. The spindle nut shall be tightened only enough to hold the wheel in place.

(6) Grinding machine wheels shall turn at a speed that is compatible with the rated speed of the wheel.

(7) Flanges and blotters shall be used only with wheels designed for their use. Flanges shall be of a type ensuring retention of pieces of the wheel in case of breakage.

(8) Abrasive wheels with operational defects shall not be used.

(h) Rotating parts, drives and connections. (1) Rotating parts, such as bars and pulleys, that are located 7 feet (2.13 m) or less above working surfaces shall be guarded to prevent employee contact with moving parts.

(2) Belt, rope, and chain drives shall be guarded to prevent employees from coming into contact with moving parts.

(3) Gears, sprockets, and chains shall be guarded to prevent employees from coming into contact with moving parts. This requirement does not apply to manually operated sprockets.

§1917.152—Welding, cutting and heating (hot work)¹²
(See also §1917.2, definition of Hazardous cargo, materials, substance, or atmosphere).

(a) Definition. “Hot work” means riveting, welding, flame cutting, or other fire or spark-producing operation.

(b) Hot work in confined spaces. Hot work shall not be performed in a confined space until a designated person has tested the atmosphere and determined that it is not hazardous.

¹²The U.S. Coast Guard at 33 CFR 126.15(c) requires prior permission of the Captain of the Port if welding or other hot work is to be carried out at a facility where dangerous cargoes as defined by 33 CFR 126.07 are located or being handled.

(c) Fire protection. (1) To the extent possible, hot work shall be performed in designated locations that are free of hazards.

(2) When hot work must be performed in a location that is not free of fire hazards, all necessary precautions shall be taken to confine heat, sparks, and slag so that they cannot contact flammable or combustible material.

(3) Fire extinguishing equipment suitable for the location shall be immediately available and shall be maintained in readiness for use at all times.

(4) When the hot work operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire during hot work and for a sufficient time after completion of the work to ensure that no fire hazard remains. The employer shall instruct all employees involved in hot work operations as to potential fire hazards and the use of firefighting equipment.

(5) Drums and containers which contain or have contained flammable or combustible liquids shall be kept closed. Empty containers shall be removed from the hot work area.

(6) When openings or cracks in flooring cannot be closed, precautions shall be taken to ensure that no employees or flammable or combustible materials on the floor below are exposed to sparks dropping through the floor. Similar precautions shall be taken regarding cracks or holes in walls, open doorways, and open or broken windows.

(7) Hot work shall not be performed:

(i) In flammable or potentially flammable atmospheres:

(ii) On or in equipment or tanks that have contained flammable gas or liquid or combustible liquid or dust-producing material, until a designated person has tested the atmosphere inside the equipment or tanks and determined that they are not hazardous; or

(iii) Near any area in which exposed readily ignitable materials such as bulk sulphur, baled paper or cotton are stored. Bulk sulphur is excluded from this prohibition if suitable precautions are followed, the person in charge is knowledgeable, and the person performing the work has been instructed in preventing and extinguishing sulphur fires.

(8)(i) Drums, containers or hollow structures that have contained flammable or combustible substances shall either be filled with water or cleaned, and shall then be ventilated. A designated person shall test the atmosphere and determine that it is not hazardous before hot work is performed on or in such structures.

(ii) Before heat is applied to a drum, container, or hollow structure, an opening to release built-up pressure during heat application shall be provided.

(d) Gas welding and cutting. (1) Compressed gas cylinders:

(i) Shall have valve protection caps in place except when in use, hooked up or secured for movement. Oil shall not be used to lubricate caps;

(ii) Shall be hoisted only while secured, as on a cradle or pallet, and shall not be hoisted by magnet, choker sling, or cylinder caps;

(iii) Shall be moved only by tilting or rolling on their bottom edges;

(iv) Shall be secured when moved by vehicle;

(v) Shall be secured while in use;

(vi) Shall have valves closed when cylinders are empty, being moved, or stored;

(vii) Shall be secured upright except when hoisted or carried;

(viii) Shall not be freed when frozen by prying the valves or caps with bars or by hitting the valve with a tool;

- (ix)** Shall not be thawed by boiling water;
- (x)** Shall not be exposed to spark, hot slag, or flame;
- (xi)** Shall not be permitted to become part of electrical circuits or have electrodes struck against them to strike arcs;
- (xii)** Shall not be used as rollers or supports;
- (xiii)** Shall not have contents used for purposes not authorized by the supplier;
- (xiv)** Shall not be used if damaged or defective;
- (xv)** Shall not have gases mixed within, except by gas suppliers;
- (xvi)** Shall be stored so that oxygen cylinders are separated from fuel gas cylinders and combustible materials by either a minimum distance of 20 feet (6.1 m) or a barrier having a fire-resistance rating of 30 minutes; and
- (xvii)** Shall not have objects that might either damage the safety device or obstruct the valve placed on top of the cylinder when in use.

(2) *Use of fuel gas.* Fuel gas shall be used only as follows:

- (i)** Before regulators are connected to cylinder valves, the valves shall be opened slightly (cracked) and closed immediately to clear away dust or dirt. Valves shall not be cracked if gas could reach possible sources of ignition;
- (ii)** Cylinder valves shall be opened slowly to prevent regulator damage and shall not be opened more than 1 1/2 turns. Any special wrench required for emergency closing shall be positioned on the valve stem during cylinder use. For manifolded or coupled cylinders, at least one wrench shall be immediately available. Nothing shall be placed on top of a cylinder or associated parts when the cylinder is in use.

(iii) Pressure-reducing regulators shall be attached to cylinder valves when cylinders are supplying torches or devices equipped with shut-off valves;

(iv) Cylinder valves shall be closed and gas released from the regulator or manifold before regulators are removed;

(v) Leaking fuel gas cylinder valves shall be closed and the gland nut tightened. If the leak continues, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous. If a regulator attached to a valve stops a leak, the cylinder need not be removed from the workplace but shall be tagged and may not be used again before it is repaired; and

(vi) If a plug or safety device leaks, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous.

(3) Hose. **(i)** Fuel gas and oxygen hoses shall be easily distinguishable from each other by color or sense of touch. Oxygen and fuel hoses shall not be interchangeable. Hoses having more than one gas passage shall not be used.

(ii) When oxygen and fuel gas hoses are taped together, not more than four inches (10.16 cm) of each 12 inches (30.48 cm) shall be taped.

(iii) Hose shall be inspected before use. Hose subjected to flashback or showing evidence of severe wear or damage shall be tested to twice the normal working pressure but not less than 200 p.s.i. (1378.96 kPa) before reuse. Defective hose shall not be used.

(iv) Hose couplings shall not unlock or disconnect without rotary motion.

(v) Hose connections shall be clamped or securely fastened to withstand twice the normal working pressure but not less than 300 p.s.i. (2068.44 kPa) without leaking.

(vi) Gas hose storage boxes shall be ventilated.

(4) Torches. (i) Torch tip openings shall only be cleaned with devices designed for that purpose.

(ii) Torches shall be inspected before each use for leaking shut-off valves, hose couplings, and tip connections. Torches with such defects shall not be used.

(iii) Torches shall not be lighted from matches, cigarette lighters, other flames, or hot work.

(5) Pressure regulators. Pressure regulators, including associated gauges, shall be maintained in safe working order.

(6) Operational precautions. Gas welding equipment shall be maintained free of oil and grease.

(e) Arc welding and cutting. (1) Manual electrode holders. (i) The employer shall ensure that only manual electrode holders intended for arc welding and cutting and capable of handling the maximum current required for such welding or cutting shall be used.

(ii) Current-carrying parts passing through those portions of the holder gripped by the user and through the outer surfaces of the jaws of the holder shall be insulated against the maximum voltage to ground.

(2) Welding cables and connectors. (i) Arc welding and cutting cables shall be insulated, flexible, and capable of handling the maximum current required by the operations, taking into account the duty cycles.

(ii) Only cable free from repairs or splices for 10 feet (3 m) from the electrode holder shall be used unless insulated connectors or splices with insulating quality equal to that of the cable are provided.

(iii) When a cable other than the lead mentioned in paragraph **(e)(2)(ii)** of this section wears and exposes bare conductors, the portion exposed shall not be used until it is protected by insulation equivalent in performance capacity to the original.

(iv) Insulated connectors of equivalent capacity shall be used for connecting or splicing cable. Cable lugs, where used as connectors, shall provide electrical contact. Exposed metal parts shall be insulated.

(3) *Ground returns and machine grounding.* **(i)** Ground return cables shall have current-carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting units served.

(ii) Structures or pipelines, other than those containing gases or flammable liquids or conduits containing electrical circuits, may be used in the ground return circuit if their current-carrying capacity equals or exceeds the total maximum output capacities of the welding or cutting units served.

(iii) Structures or pipelines forming a temporary ground return circuit shall have electrical contact at all joints. Arcs, sparks, or heat at any point in the circuit shall cause rejection as a ground circuit.

(iv) Structures or pipelines acting continuously as ground return circuits shall have joints bonded and maintained to ensure that no electrolysis or fire hazard exists.

(v) Arc welding and cutting machine frames shall be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of the current. Grounding circuits shall have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(vi) Ground connections shall be mechanically and electrically adequate to carry the current.

(4) When electrode holders are left unattended, electrodes shall be removed and holders placed to prevent employee injury.

(5) Hot electrode holders shall not be dipped in water.

(6) The employer shall ensure that when arc welders or cutters leave or stop work or when machines are moved, the power supply switch shall be kept in the off position.

(7) Arc welding or cutting equipment having a functional defect shall not be used.

(8)(i) Arc welding and cutting operations shall be separated from other operations by shields, screens, or curtains to protect employees in the vicinity from the direct rays and sparks of the arc.

(ii) Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with paragraph (h) of this section. When welders are exposed to their own arc or to each other's arc, they shall wear filter lenses complying with the requirement of paragraph (h) of this section.

(9) The control apparatus of arc welding machines shall be enclosed, except for operating wheels, levers, and handles.

(10) Input power terminals, top change devices, and live metal parts connected to input circuits shall be enclosed and accessible only by means of insulated tools.

(11) When arc welding is performed in wet or high-humidity conditions, employees shall use additional protection, such as rubber pads or boots, against electric shock.

(f) *Ventilation and employee protection in welding, cutting and heating.* (1) *Mechanical ventilation requirements.* The employer shall ensure that general mechanical ventilation or local exhaust systems shall meet the following requirements:

(i) General mechanical ventilation shall maintain vapors, fumes, and smoke below a hazardous level.

(ii) Local exhaust ventilation shall consist of movable hoods positioned close to the work and shall be of such capacity and arrangement as to keep breathing zone concentrations below hazardous levels.

(iii) Exhausts from working spaces shall be discharged into the open air, clear of intake air sources;

(iv) Replacement air shall be clean and respirable; and

(v) Oxygen shall not be used for ventilation, cooling, or cleaning clothing or work areas.

(2) Hot work in confined spaces. Except as specified in paragraphs **(f)(3)(ii)** and **(f)(3)(iii)** of this section, when hot work is performed in a confined space the employer shall ensure that:

(i) General mechanical or local exhaust ventilation shall be provided; or

(ii) Employees in the space shall wear supplied air respirators in accordance with §1910.134 and a standby on the outside shall maintain communication with employees inside the space and shall be equipped and prepared to provide emergency aid.

(3) Welding, cutting or heating of toxic metals. **(i)** In confined or enclosed spaces, hot work involving the following metals shall only be performed with general mechanical or local exhaust ventilation that ensures that employees are not exposed to hazardous levels of fumes:

(A) Lead based metals;

(B) Cadmium-bearing filler materials; and

(C) Chromium-bearing metals or metals coated with chromium-bearing materials.

(ii) In confined or enclosed spaces, hot work involving the following metals shall only be performed with local exhaust ventilation meeting the requirement of paragraph **(f)(1)** of this section or by employees wearing supplied air respirators in accordance with §1910.134:

(A) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials;

(B) Metals containing lead other than as an impurity, or coated with lead-bearing materials;

(C) Cadmium-bearing or cadmium-coated base metals; and

(D) Metals coated with mercury-bearing materials.

(iii) Employees performing hot work in confined or enclosed spaces involving beryllium-containing base or filler metals shall be protected by local exhaust ventilation and wear supplied air respirators or self-contained breathing apparatus, in accordance with the requirements of §1910.134.

(iv) The employer shall ensure that employees performing hot work in the open air that involves any of the metals listed in paragraphs (f)(3)(i) and (f)(3)(ii) of this section shall be protected by respirators in accordance with the requirement of §1910.134, and those working on beryllium-containing base or filler metals shall be protected by supplied air respirators, in accordance with the requirements of §1910.134.

(v) Any employee exposed to the same atmosphere as the welder or burner shall be protected by the same type of respiratory and other protective equipment as that worn by the welder or burner.

(4) *Inert-gas metal-arc welding.* Employees shall not engage in and shall not be exposed to the inert-gas metal, welding process unless the following precautions are taken:

(i) Chlorinated solvents shall not be used within 200 feet (61 m) of the exposed arc. Surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is performed on them.

(ii) Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with the requirement of paragraph **(h)** of this section. When welders are exposed to their own arc or to each other's arc, filter lenses

complying with the requirements of paragraph **(h)** of this section shall be worn to protect against flashes and radiant energy.

(iii) Employees exposed to radiation shall have their skin covered completely to prevent ultraviolet burns and damage. Helmets and hand shields shall not have leaks, openings, or highly reflective surfaces.

(iv) Inert-gas metal-arc welding on stainless steel shall not be performed unless exposed employees are protected either by local exhaust ventilation or by wearing supplied air respirators.

(g) *Welding, cutting, and heating on preservative coatings.* **(1)** Before hot work is commenced on surfaces covered by a preservative coating of unknown flammability, a test shall be made by a designated person to determine the coating's flammability. Preservative coatings shall be considered highly flammable when scrapings burn with extreme rapidity.

(2) Appropriate precaution shall be taken to prevent ignition of highly flammable hardened preservative coatings. Highly flammable coatings shall be stripped from the area to be heated. An uncoiled fire hose with fog nozzle, under pressure, shall be immediately available in the hot work area.

(3) Surfaces covered with preservative coatings shall be stripped for at least 4 inches (10.16 cm) from the area of heat application or employees shall be protected by supplied air respirators in accordance with the requirements of 1910.134.

(h) *Protection against radiant energy.* **(1)** Employees shall be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields, or face shields with filter lenses complying with the requirements of this paragraph.

(2) Filter lenses shall have an appropriate shade number, as indicated in Table G-1, for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

(3) If filter lenses are used in goggles worn under the helmet, the shade numbers of both lenses equals the value shown in Table G-1 for the operation.

TABLE G-1 - FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

Operation	Shade No.
Soldering	2
Torch Brazing	3 or 4.
Light cutting, up to 1 in. (25 mm)	3 or 4.
Medium cutting, 1 in. (25 mm) to 6 in. (15 cm)	4 or 5.
Heavy cutting, over 6 inches (15 cm)	5 or 6.
Light gas welding, up to 1/8 in. (3.1 mm)	4 or 5.
Medium gas welding, 1/8 in. (3.1 mm) to 1/2 in. (12.7 mm)	5 or 6.
Heavy gas welding, over 1/2 in. (12.7 mm)	6 or 8.
shielded Metal-Arc Welding 1/16 to 5/32 in. (3.9 mm) electrodes	10
Inert-gas Metal-Arc Welding (Non-ferrous) 1/16 in. (1.5 mm) to 5/32 in. (3.9 mm) electrodes	11
Shielded Metal-Arc Welding:	
3/16 in. (4.7 mm) to 1/4 in. (6.3 mm) electrodes	12
5/16 in. (7.9 mm) to 3/8 in. (9.5 mm) electrodes	14

§1917.153—Spray painting (See also §1917.2, definition of Hazardous cargo, materials, substance, or atmosphere).

(a) *Scope.* This section covers painting operations connected with maintenance of structures, equipment, and gear at the marine terminal and of transient equipment serviced at the terminal. It does not apply to overall painting of terminal structures under construction, major repair or rebuilding of terminal structures, or portable spraying apparatus not used regularly in the same location.

(b) Definitions. (1) “Spraying area” means any area where flammable vapors, mists or combustible residues, dusts or deposits may be present due to paint spraying operations.

(2) “Spray booth” means an enclosure containing a flammable or combustible spraying operation and confining and limiting the escape of paint, vapor and residue by means of a powered exhaust system.

(3) “Approved” means, for the purpose of this section, that the equipment has been approved for the specified use by a nationally recognized testing laboratory.

(c) Spray painting requirements for door and outdoor spraying areas and booths. (1) Shut-off valves, containers or piping with attached hoses or flexible connections shall have shut-off valves closed at the connection when not in use.

(2) Pumps used to transfer paint supplies shall have automatic pressure-relieving devices.

(3) Hoses and couplings shall be inspected before use. Hoses showing deterioration, leakage, or weakness in the carcass or at the couplings shall be removed from service.

(4)(i) No open flame or spark-producing equipment shall be within 20 feet (6.1 m) of a spraying area unless it is separated from the spraying area by a fire-retardant partition.

(ii) Hot surfaces shall not be located in spraying areas.

(iii) Whenever combustible residues may accumulate on electrical installations, wiring shall be in rigid conduit or in boxes containing no taps, splices, or connections.

(iv) Portable electric lights shall not be used during spraying operations. Lights used during cleaning or repairing operations shall be approved for the location in which they are used.

(5) When flammable or combustible liquids are being transferred between containers, both containers shall be bonded and grounded.

(6)(i) Spraying shall be performed only in designated spray booths or spraying areas.

(ii) Spraying areas shall be kept as free from combustible residue accumulation as practicable.

(iii) Residue scrapings, debris, rags, and waste shall be removed from the spraying area as they accumulate.

(7) Spraying with organic peroxides and other dual-component coatings shall only be conducted in sprinkler-equipped spray booths.

(8) Only the quantity of flammable or combustible liquids required for the operation shall be allowed in the spraying area, and in no case shall the amount exceed a one-day supply.

(9) Smoking shall be prohibited and “No Smoking” signs shall be posted in spraying and paint storage areas.

(d) *Additional requirements for spraying areas and spray booths.*

(1) Distribution or baffle plates shall be of noncombustible material and shall be removable or accessible for cleaning. They shall not be located in exhaust ducts.

(2) Any discarded filter shall be removed from the work area or placed in water.

(3) Filters shall not be used when the material being sprayed is highly susceptible to spontaneous heating and ignition.

(4) Filters shall be noncombustible or of an approved type. The same filter shall not be used when spraying with different coating materials if the combination of materials may spontaneously ignite.

(5) Spraying areas shall be mechanically ventilated for removal of flammable and combustible vapor and mist.

(6) Mechanical ventilation shall be in operation during spraying operations and long enough thereafter to exhaust hazardous vapor concentrations.

(7) Rotating fan elements shall be nonsparking or the casing shall consist of or be lined with nonsparking material.

(8) Piping systems conveying flammable or combustible liquids to the spraying booth or area shall be made of metal and be both bonded and grounded.

(9) Air exhausted from spray operations shall not contaminate makeup air or other ventilation intakes. Exhausted air shall not be recirculated unless it is first cleaned of any hazardous contaminants.

(10) Original closed containers, approved portable tanks, approved safety cans or a piping system shall be used to bring flammable or combustible liquids into spraying areas.

(11) If flammable or combustible liquids are supplied to spray nozzles by positive displacement pumps, the pump discharge line shall have a relief valve discharging either to a pump section or detached location, or the line shall be equipped with a device to stop the prime mover when discharge pressure exceeds the system's safe operating pressure.

(12) Wiring, motors and equipment in a spray booth shall be of approved explosion-proof type for Class I, Group D locations and conform to Subpart S of Part 1910 of this chapter for Class I, Division 1, Hazardous Locations. Wiring, motors and equipment within 20 feet (6.1 m) of any interior spraying area and not separated by vapor-tight partitions shall not produce sparks during operation and shall conform to the requirements of Subpart S of Part 1910 of this chapter for Class I, Division 2, Hazardous Locations.

(13) Outside electrical lights within 10 feet (3.05 m) of spraying areas and not separated from the areas by partitions shall be enclosed and protected from damage.

(e) Additional requirements for spray booths. (1) Spray booths shall be substantially constructed of noncombustible material and have smooth interior surfaces. Spray booth floors shall be covered with noncombustible material. As an aid to cleaning, paper may be used to cover the floor during painting operations if it is removed after the painting is completed.

(2) Spray booths shall be separated from other operations by at least 3 feet (0.91 m) or by fire-retardant partitions or walls.

(3) A space of at least 3 feet (0.91 m) on all sides of the spray booth shall be maintained free of storage or combustible materials.

(4) Metal parts of spray booths, exhaust ducts, piping and airless high-pressure spray guns and conductive objects being sprayed shall be grounded.

(5) Electric motors driving exhaust fans shall not be located inside booths or ducts.

(6) Belts shall not enter ducts or booths unless the belts are completely enclosed.

(7) Exhaust ducts shall be made of steel, shall have sufficient access doors to permit cleaning, and shall have a minimum clearance of 18 inches (0.46 m) from combustible materials. Any installed dampers shall be fully opened when the ventilating system is operating.

(8) Spray booths shall not be alternately used to spray different types of coating materials if the combination of the materials may spontaneously ignite unless deposits of the first material are removed from the booth and from exhaust ducts before spraying of the second material begins.

§1917.154—Compressed air.

Employees shall be protected by chip guarding and personal protective equipment complying with the provisions of Subpart E of this part during cleaning with compressed air. Compressed air used for cleaning shall not exceed a pressure of 30 psi. Compressed air shall not be used to clean employees.

§1917.155—Air receivers.

(a) *Application.* This section applies to compressed air receivers and equipment used for operations such as cleaning, drilling, hoisting and chipping. It does not apply to equipment used to convey materials or in such transportation applications as railways, vehicles, or cranes.

(b) *Gauges and valves.* **(1)** Air receivers shall be equipped with indicating pressure gauges and spring-loaded safety valves. Safety valves shall prevent receiver pressure from exceeding 110 percent of the maximum allowable working pressure.

(2) No other valves shall be placed between air receivers and their safety valves.

§1917.156—Fuel handling and storage.

(a) *Liquid fuel.* **(1)** Only designated persons shall conduct fueling operations.

(2) In case of spillage, filler caps shall be replaced and spillage disposed of before engines are started.

(3) Engines shall be stopped and operators shall not be on the equipment during refueling operations.

(4) Smoking and open flames shall be prohibited in areas used for fueling, fuel storage or enclosed storage of equipment containing fuel.

(5) Equipment shall be refueled only at designated locations.

(6) Liquid fuels not handled by pump shall be handled and transported only in portable containers or equivalent means designed for that purpose. Portable containers shall be metal, have tight closures with screw or spring covers and shall be equipped with spouts or other means to allow pouring without spilling. Leaking containers shall not be used.

(7) Flammable liquids may be dispensed in the open from a tank or from other vehicles equipped for delivering fuel to another vehicle only if:

(i) Dispensing hoses do not exceed 50 feet (15.24 m) in length; and

(ii) Any powered dispensing nozzles used are of the automatic-closing type.

(8) Liquid fuel dispensing devices shall be provided with an easily accessible and clearly identified shut-off device, such as a switch or circuit breaker, to shut off the power in an emergency.

(9) Liquid fuel dispensing devices, such as pumps, shall be mounted either on a concrete island or be otherwise protected against collision damage.

(b) Liquefied gas fuels--(1) Fueling locations. **(i)** Liquefied gas powered equipment shall be fueled only at designated locations.

(ii) Equipment with permanently mounted fuel containers shall be charged outdoors.

(iii) Equipment shall not be fueled or stored near underground entrances, elevator shafts or other places where gas or fumes might accumulate.

(2) Fuel containers. **(i)** When removable fuel containers are used, the escape of fuel when containers are exchanged shall be minimized by:

(A) Automatic quick-closing couplings (closing in both directions when uncoupled) in fuel lines; or

(B) Closing fuel container valves and allowing engines to run until residual fuel is exhausted.

(ii) Pressure-relief valve openings shall be in continuous contact with the vapor space (top) of the cylinder.

(iii) Fuel containers shall be secured to prevent their being jarred loose, slipping, or rotating.

(iv) Containers shall be located to prevent damage to the container. If located within a compartment, that compartment shall be vented. Containers near the engine or exhaust system shall be shielded against direct heat radiation.

(v) Container installation shall provide the container with at least the vehicle's road clearance under maximum spring deflection, which shall be to the bottom of the container or to the lowest fitting on the container or housing, whichever is lower.

(vi) Valves and connections shall be protected from contact damage. Permanent protection shall be provided for fittings on removable containers.

(vii) Defective containers shall be removed from service.

(3) Fueling operations. **(i)** To the extent applicable, fueling operations for liquefied gas fuels shall also comply with paragraph **(a)** of this section.

(ii) Using matches or flames to check for leaks is prohibited.

(iii) Containers shall be examined before recharging and again before reuse for the following:

(A) Dents, scrapes and gouges of pressure vessels;

(C) Debris in relief valves;

(D) Leakage at valves or connections; and

(E) Deterioration or loss of flexible seals in filling or servicing connections.

(4) *Fuel storage.* (i) Stored fuel containers shall be located to minimize exposure to excessive temperatures and physical damage.

(ii) Containers shall not be stored near exits, stairways or areas normally used or intended for egress.

(iii) Outlet valves of containers in storage or transport shall be closed. Relief valves shall connect with vapor spaces.

(5) *Vehicle storage and servicing.* (i) Liquefied gas fueled vehicles may be stored or serviced inside garages or shops only if there are no fuel system leaks.

(ii) Liquefied gas fueled vehicles under repair shall have container shut-off valves closed unless engine operation is necessary for repairs.

(iii) Liquefied gas fueled vehicles shall not be parked near open flames, sources of ignition or unventilated open pits.

§1917.157—Battery charging and changing.

(a) Only designated persons shall change or charge batteries.

(b) Battery charging and changing shall be performed only in areas designated by the employer.

(c) Smoking and other ignition sources are prohibited in charging areas.

(d) Filler caps shall be in place when batteries are being moved.

(e) Parking brakes shall be applied before batteries are charged or changed.

(f) When a jumper battery is connected to a battery in a vehicle, the ground lead shall connect to ground away from the vehicle's battery. Ignition, and lights and accessories on the vehicle shall be turned off before connections are made.

(g) Batteries shall be free of corrosion buildup and cap vent holes shall be open.

(h) Adequate ventilation shall be provided during charging.

(i) Facilities for flushing the eyes, body and work area with water shall be provided wherever electrolyte is handled, except that this requirement does not apply when employees are only checking battery electrolyte levels or adding water.

(j) Carboy tilters or siphons shall be used to handle electrolyte in large containers.

(k) Battery handling equipment which could contact battery terminals or cell connectors shall be insulated or otherwise protected.

(l) Metallic objects shall not be placed on uncovered batteries.

(m) When batteries are being charged, the vent caps shall be in place.

(n) Chargers shall be turned off when leads are being connected or disconnected.

(o) Installed batteries shall be secured to avoid physical or electrical contact with compartment walls or components.

§1917.158—Prohibited operations.

(a) Spray painting and abrasive blasting operations shall not be conducted in the vicinity of cargo handling operations.

(b) Welding and burning operations shall not be conducted in the vicinity of cargo handling operations unless such hot work is part of the cargo operation.

**APPENDIX I TO PART 1917—SPECIAL CARGO GEAR
AND CONTAINER SPREADER TEST REQUIREMENTS
(MANDATORY) [SEE §1917.50(c)(5)]**

Type gear	Test requirement	Tested by	Proof test	
A. ALL SPECIAL CARGO HANDLING GEAR PURCHASED OR MANUFACTURED ON OR AFTER JANUARY 21, 1998				
1. Safe Working Load--greater than 5 short tons (10,000 lbs./4.5 metric tons).	Prior to initial use.	OSHA accredited agency only.	Up to 20 short tons.	125% SWL.
	Prior to reuse after structural damage repair	OSHA accredited agency or designated person.	From 20 to 50 short tons.	5 short tons in excess of SWL.
	Every four years after initial proof load test.	(40) (1) 125% SWL.	Over 50 short tons.	110% SWL.
2. Safe Working Load--5 short tons or less.	Prior to initial use. Prior to reuse after structural damage repair.	OSHA accredited agency or designated person.	125% SWL.	
3. Intermodal container spreaders not part of vessel's cargo handling gear	Prior to initial use. Prior to reuse after structural damage repair.	OSHA accredited agency only.	125% SWL.	
	Every four years after initial proof load test.	OSHA accredited agency or designated person.		

**APPENDIX I TO PART 1917—SPECIAL CARGO GEAR
AND CONTAINER SPREADER TEST REQUIREMENTS
(MANDATORY) [SEE §1917.50(c)(5)] (CONTINUED)**

Type gear	Test requirement	Tested by	Proof test	
B. ALL SPECIAL CARGO HANDLING GEAR IN USE PRIOR TO JANUARY 21, 1998				
1. Any Safe Working Load.	Every four years starting on January 21, 1998.	OSHA accredited agency or designated person.	Up to 20 short tons. Over 50 short tons.	125% SWL. 5 short tons in excess of SWL.
	Prior to initial use or prior to reuse after structural damage repair.	OSHA accredited agency.	From 20 to 50 short tons.	110% SWL
2. Intermodal container spreaders not part of ship's gear.	Every four years starting on January 21, 1998.	OSHA accredited agency or designated person.	125% SWL	
	Prior to initial use or prior to reuse after structural damage repair.	OSHA accredited agency.		

Part 1918—SAFETY AND HEALTH REGULATIONS FOR LONGSHORING

Subpart A—General Provisions

§1918.1—Scope and application.

(a) The regulations of this part apply to longshoring operations and related employments aboard vessels. All cargo transfer accomplished with the use of shore-based material handling devices is covered by part 1917 of this chapter.

(b) Part 1910 of this chapter does not apply to longshoring except for the following provisions:

(1) *Access to employee exposure and medical records.* Subpart Z, §1910.1020;

(2) *Commercial diving operations.* Subpart T;

(3) *Electrical.* Subpart S when shore-based electrical installations provide power for use aboard vessels;

(4) *Hazard communication.* Subpart Z, §1910.1200;

(5) *Ionizing radiation.* Subpart Z, §1910.1096;

(6) *Noise.* Subpart G, §1910.95;

(7) *Nonionizing radiation.* Subpart G, §1910.97;

NOTE TO PARAGRAPH (b)(7): Exposures to nonionizing radiation emissions from commercial vessel radar transmitters are considered hazardous under the following situations: (a) where the radar is transmitting, the scanner is stationary, and the exposure distance is 19 feet (5.79 m) or less; or (b) where the radar is transmitting, the scanner is rotating, and the exposure distance is 5 feet (1.52 m) or less.

(8) *Respiratory protection.* Subpart I, §1910.134;

(9) *Toxic and hazardous substances.* Subpart Z applies to marine cargo handling activities except for the following:

(i) When a substance or cargo is contained within a sealed, intact means of packaging or containment complying with Department of Transportation or International Maritime Organization requirements;¹

(ii) Bloodborne pathogens, §1910.1030;

(iii) Carbon monoxide, §1910.1000 (See §1918.94(a)); and

(iv) Hydrogen sulfide, §1910.1000 (See §1918.94(f)); and

(10) *Powered industrial truck operator training.* Subpart N, §1910.178(l).

NOTE TO PARAGRAPH (b)(10): The Compliance dates of December 1, 1999 set forth in 29 CFR 1910.178(l)(7) are stayed until March 1, 2000 for Longshoring.

§1918.2—Definitions.

Barge means an unpowered, flatbottomed, shallow draft vessel including river barges, scows, carfloats, and lighters. It does not include ship shaped or deep draft barges.

Bulling means the horizontal dragging of cargo across a surface with none of the weight of the cargo supported by the fall.

Danger zone means any place in or about a machine or piece of equipment where an employee may be struck by or caught between moving parts, caught between moving and stationary objects or parts of the machine, caught between the material and a moving part of the machine, burned by hot surfaces or exposed to electric

¹ The International Maritime Organization publishes the International Maritime Dangerous Goods Code to aid compliance with the international legal requirements of the International Convention for the Safety of Life at Sea, 1960.

shock. Examples of danger zones are nip and shear points, shear lines, drive mechanisms, and areas underneath counterweights.

Designated person means a person who possesses specialized abilities in a specific area and is assigned by the employer to do a specific task in that area.

Dockboards (car and bridge plates) mean devices for spanning short distances between, for example, two barges, that is not higher than four feet (1.22 m) above the water or next lower level.

Employee means any longshore worker or other person engaged in longshoring operations or related employments other than the master, ship's officers, crew of the vessel, or any person engaged by the master to load or unload any vessel of less than 18 net tons.

Employer means a person that employs employees in longshoring operations or related employments, as defined in this section.

Enclosed space means an interior space in or on a vessel that may contain or accumulate a hazardous atmosphere due to inadequate natural ventilation. Examples of enclosed spaces are holds, deep tanks, and refrigerated compartments.

Fall hazard means the following situations:

- (1) Whenever employees are working within three feet (.91 m) of the unprotected edge of a work surface that is 8 feet (2.44 m) or more above the adjoining surface and twelve inches (.3 m) or more, horizontally, from the adjacent surface; or
- (2) Whenever weather conditions may impair the vision or sound footing of employees working on top of containers.

Fumigant is a substance, or mixture of substances, used to kill pests or prevent infestation, that is a gas or is rapidly or progressively transformed to the gaseous state, although some nongaseous or particulate matter may remain and be dispersed in the treatment space.

Gangway means any ramp-like or stair-like means of access provided to enable personnel to board or leave a vessel, including accommodation ladders, gangplanks and brows.

Hatch beam or strongback means a portable transverse or longitudinal beam placed across a hatchway that acts as a bearer to support the hatch covers.

Hazardous cargo, material, substance or atmosphere means: (1) Any substance listed in 29 CFR part 1910, subpart Z;

(2) Any material in the Hazardous Materials Table and Hazardous Materials Communications Regulations of the Department of Transportation, 49 CFR part 172;

(3) Any article not properly described by a name in the Hazardous Materials Table and Hazardous Materials Communication Regulations of the Department of Transportation, 49 CFR part 172, but which is properly classified under the definitions of those categories of dangerous articles given in 49 CFR part 173; or

(4) Any atmosphere with an oxygen content of less than 19.5 percent or greater than 23 percent.

Intermodal container means a reusable cargo container of a rigid construction and rectangular configuration; fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another; so designed to be readily filled and emptied; intended to contain one or more articles of cargo or bulk commodities for transportation by water and one or more other transport modes. The term includes completely enclosed units, open top units, fractional height units, units incorporating liquid or gas tanks and other variations fitting into the container system. It does not include cylinders, drums, crates, cases, cartons, packages, sacks, unitized loads, or any other form of packaging.

Longshoring operations means the loading, unloading, moving, or handling of cargo, ship's stores, gear, or any other materials, into, in, on, or out of any vessel.

Mississippi River System includes the Mississippi River from the head of navigation to its mouth, and navigable tributaries including the Illinois Waterway, Missouri River, Ohio River, Tennessee River, Allegheny River, Cumberland River, Green River, Kanawha River, Monongahela River, and such others to which barge operations extend.

Public vessel means a vessel owned and operated by a government and not regularly employed in merchant service.

Ramp means other flat surface devices for passage between levels and across openings not covered under the term dockboards.

Related employments means any employments performed incidental to or in conjunction with longshoring operations, including, but not restricted to, securing cargo, rigging, and employment as a porter, clerk, checker, or security officer.

River towboat means a shallow draft, low freeboard, self-propelled vessel designed to tow river barges by pushing ahead. It does not include other towing vessels.

Ro-Ro operations are those cargo handling and related operations, such as lashing, that occur on Ro-Ro vessels, which are vessels whose cargo is driven on or off the vessel by way of ramps and moved within the vessel by way of ramps and/or elevators.

Small trimming hatch means a small hatch or opening, pierced in the between deck or other intermediate deck of a vessel, and intended for the trimming of dry bulk cargoes. It does not refer to the large hatchways through which cargo is normally handled.

Vessel includes every description of watercraft or other artificial contrivance used or capable of being used for transportation on water, including special purpose floating structures not primarily designed for or used for transportation on water.

Vessel's cargo handling gear includes that gear that is a permanent part of the vessel's equipment and used for the handling of cargo other than bulk liquids. The term covers all stationary or mobile

cargo handling appliances used on board ship for suspending, raising, or lowering loads or moving them from one position to another while suspended or supported. This includes, but is not limited to, cargo elevators, forklifts, and other powered industrial equipment. It does not include gear used only for handling or holding hoses, handling ship's stores or handling the gangway, or boom conveyor belt systems for the self-unloading of bulk cargo vessels.

§1918.3—Incorporation by reference.

(a)(1) The standards of agencies of the U.S. Government, and organizations which are not agencies of the U.S. Government which are incorporated by reference in this part, have the same force and effect as other standards in this part. Only the mandatory provisions (i.e. provisions containing the word “shall” or other mandatory language) of standards incorporated by reference are adopted as standards under the *Occupational Safety and Health Act*.

(2) Any changes in the standards incorporated by reference in this part and an official historic file of such changes are available for inspection at the national office of the Occupational Safety and Health Administration, U.S. Department of Labor, Washington, DC 20210.

(3) The materials listed in paragraph **(b)** of this section are incorporated by reference in the corresponding sections noted as they exist on the date of the approval, and a notice of any change in these materials will be published in the *Federal Register*. These incorporations by reference (IBRs) were approved by the Director of the *Federal Register* in accordance with 5 U.S.C. 552(a) and 1 CFR part 51.

(4) Copies of the following standards that are issued by the respective private standards organizations may be obtained from the issuing organizations. The materials are available for purchase at the corresponding addresses of the private standards organizations noted in paragraph **(b)** of this section. In addition, all are available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington DC, and through the OSHA Docket Office, Room N2625, U.S. Department of

Labor, 200 Constitution Ave., Washington, DC 20210, or any of OSHA's regional offices.

(b) The following material is available for purchase from the American National Standards Institute (ANSI), 11 West 42nd St., New York, NY 10036:

(1) ANSI A14.1-1990, Safety Requirements for Portable Wood Ladders; IBR approved for §1918.24(g)(1).

(2) ANSI A14.2-1990, Safety Requirements for Portable Metal Ladders; IBR approved for §1918.24(g)(2).

(3) ANSI A14.5-1992, Safety Requirements for Portable Reinforced Plastic Ladders; IBR approved for §1918.24(g)(3).

(4) ANSI Z-87.1-1989, Practice for Occupational and Educational Eye and Face Protection; IBR approved for §1918.101(a)(1).

(5) ANSI Z-89.1-1986, Personnel Protection-Protective Headwear for Industrial Workers-Requirements; IBR approved for §1918.103(b).

(6) ANSI Z-41-1991, American National Standard for Personal Protection—Protective Footwear; IBR approved for §1918.104(b).

§1918.4—OMB control numbers under The Paperwork Reduction Act.

The following list identifies the 29 CFR citations for sections or paragraphs in this part that contain a collection of information requirement approved by the Office of Management and Budget (OMB). This list also provides the control number assigned by OMB to each approved requirement; control number 1218-0196 expires on May 31, 2002 and control number 1218-0003 expires on July 31, 2001.

29 CFR citation	OMB control number	29 CFR citation	OMB control number
1918.22(g)	1218-0196	1918.66(a)(8)	1218-0196
1918.24(i)(1)	1218-0196	1918.66(a)(9)	1218-0196
1918.61(b)(2)	1218-0196	1918.66(a)(11)	1218-0196
1918.61(c)	1218-0196	1918.66(a)(15)	1218-0196
1918.61(f)(1)	1218-0003	1918.66(d)(2)	1218-0196
1918.61(f)(2)	1218-0003	1918.66(d)(4)	1218-0196
1918.61(g)	1218-0003	1918.66(f)(1)(v)	1218-0196
1918.61(h)	1218-0003	1918.85(a)	1218-0196
1918.61(i)	1218-0003	1918.85(b)(4)(ii)	1218-0196
1918.62(b)(1)	1218-0196	1918.85(k)(13)	1218-0196
1918.62(b)(5)	1218-0196	1918.86(b)	1218-0196
1918.62(c)(1)	1218-0196	1918.86(e)	1218-0196
1918.62(d)(1)	1218-0196	1918.86(g)	1218-0196
1918.62(g)(3)	1218-0196	1918.86(h)	1218-0196
1918.62(g)(4)	1218-0196	1918.93(b)	1218-0196
1918.62(h)(1)	1218-0196	1918.93(d)(4)	1218-0196
1918.62(h)(3)(ii)	1218-0196	1918.94(c)	1218-0196
1918.62(h)(4)	1218-0196	1918.96(e)(2)	1218-0196
1918.64(k)(1)	1218-0196	1918.97(d)(7)	1218-0196
1918.64(k)(2)	1218-0196	1918.100(a)	1218-0196
1918.65(b)(1)	1218-0196	1918.100(e)(3)	1218-0196
1918.66(a)(2)	1218-0196		

Subpart B—Gear Certification

§1918.11—Gear certification (See also §1918.2, definition of “Vessel’s cargo handling gear” and §1918.51).

(a) The employer shall not use the vessel’s cargo handling gear until it has been ascertained that the vessel has a current and valid cargo gear register and certificates that in form and content are in accordance with the recommendations of the International Labor Office, as set forth in Appendix I of this part, and as provided by International Labor Organization Convention No. 152, and that shows that the cargo gear has been tested, examined and heat treated by or under the supervision of persons or organizations

defined as competent to make register entries and issue certificates pursuant to paragraphs (b) and (c) of this section.

(1) Annual thorough examinations under ILO 152 are required after July 27, 1998.

(2) Testing under ILO 152 is required after July 16, 2001.

(3) In the interim period(s), prior to the effective dates noted in paragraphs (a) (1) and (2), vessels with cargo gear and a cargo gear register according to ILO 32 are deemed to meet the requirements of this paragraph (a).

(b) Public vessels and vessels holding a valid Certificate of Inspection issued by the U.S. Coast Guard pursuant to 46 CFR part 91 are deemed to meet the requirements of paragraph (a) of this section.

(c) With respect to U.S. vessels not holding a valid Certificate of Inspection issued by the U.S. Coast Guard, entries in the registers and the issuance of certificates required by paragraph (a) of this section shall be made only by competent persons currently accredited by the U.S. Department of Labor (OSHA) for full function vessels or loose gear and wire rope testing, as appropriate, as provided in part 1919 of this chapter.

(d) With respect to vessels under foreign registries, persons or organizations competent to make entries in the registers and issue the certificates required by paragraph (a) of this section shall be:

(1) Those acceptable as such to any foreign nation;

(2) Those acceptable to the Commandant of the U.S. Coast Guard;
or

(3) Those currently accredited by the U.S. Department of Labor (OSHA), for full function vessels or loose gear and wire rope testing, as appropriate and as provided in part 1919 of this chapter.

Subpart C—Gangways and Other Means of Access

§1918.21—General requirements.

The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until all of the applicable requirements of this subpart have been met.

(a) If possible, the vessel's means of access shall be located so that suspended loads do not pass over it. In any event, suspended loads shall not be passed over the means of access while employees or others are on it.

(b) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured, trimmed and equipped with at least one substantial handrail, 33 inches (0.84 m) in height, shall be provided between the top of the bulwark and the deck.

(c) The means of access shall be illuminated for its full length in accordance with §1918.92.²

§1918.22—Gangways.

(a) Whenever practicable, a gangway of not less than 20 inches (0.51 m) in width, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a straight ladder meeting the requirements of §1918.24 that extends at least 36 inches (0.91 m) above the upper landing surface and is secured against shifting or slipping shall be provided. When conditions are such that neither a gangway nor straight ladder can be used, a Jacob's ladder meeting the requirements of §1918.23 may be used.

² §1918.92 requires, along with other requirements, an average light intensity of five foot- candles (54 lux).

(b) Each side of the gangway, and the turntable, if used, shall have a hand rail with a minimum height of 33 inches (0.84 m) measured perpendicularly from rail to walking surfaces at the stanchion, with a midrail. Rails shall be of wood, pipe, chain, wire, rope or materials of equivalent strength and shall be kept taut always. Portable stanchions supporting railings shall be supported or secured to prevent accidental dislodgement.

(c) The gangway shall be kept properly trimmed.

(d) When a fixed flat tread accommodation ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

(e) When the gangway overhangs the water so that there is danger of employees falling between the ship and the dock, a net or suitable protection shall be provided to prevent employees from receiving serious injury from falls to a lower level.

(f) If the foot of a gangway is more than one foot (0.30 m) away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with a hand rail with a minimum height of approximately 33 inches (0.84 m) with midrails on both sides.

(g) Gangways shall be kept clear of supporting bridles and other obstructions, to provide unobstructed passage. If, because of design, the gangway bridle cannot be moved to provide unobstructed passage, then the hazard shall be properly marked to alert employees of the danger.

(h) Obstructions shall not be laid on or across the gangway.

(i) Handrails and walking surfaces of gangways shall be maintained in a safe condition to prevent employees from slipping or falling.

(j) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the requirements of this section.

§1918.23—Jacob’s ladders.

(a) Jacob’s ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(b) A Jacob’s ladder shall either hang without slack from its lashings or be pulled up entirely.

(c) When a Jacob’s ladder is used as the means of access to a barge being worked, spacers (bumpers) shall be hung between the vessel, barge, or other structure to which the barge is tied alongside, or other equally effective means shall be provided to prevent damage to the bottom rungs of the ladder.

(d) When a Jacob’s ladder is being used so that there is a danger of an employee falling or being crushed between the vessel, barge, or other structure (pier), suitable protection shall be provided.

§1918.24—Fixed and portable ladders.

(a) There shall be at least one safe and accessible ladder for each gang working in a single hatch. An effective means of gaining a handhold shall be provided at or near the head of each vertical fixed ladder. No more than two ladders are required in any hatch regardless of the number of gangs present.

(b) When any fixed ladder is visibly unsafe (or known to be unsafe), the employer shall identify such ladder and prohibit its use by employees.

(c) Where portable straight ladders are used, they shall be of sufficient length to extend three feet (0.91 m) above the upper landing surface, and be positively secured or held against shifting or slipping. When conditions are such that a straight ladder cannot be used, Jacob’s ladders meeting the requirements of §1918.23 may be used.

(d) For vessels built after July 16, 2001, when six inches (15.24 cm) or more clearance does not exist behind the rungs of a fixed ladder, the ladder shall be deemed “unsafe” for the purposes of this section. Alternate means of access (for example, a portable ladder) must be used.

(e)(1) Where access to or from a stowed deckload or other cargo is needed and no other safe means is available, ladders or steps of adequate strength shall be furnished and positively secured or held against shifting or slipping while in use. Steps formed by the cargo itself are acceptable when the employer demonstrates that the nature of the cargo and the type of stowage provides equivalent safe access.

(2) Where portable straight ladders are used they shall be of sufficient length to extend at least three feet (0.91 m) above the upper landing surface.

(f) The following standards for existing manufactured portable ladders must be met:

(1) Rungs of manufactured portable ladders obtained before January 21, 1998 shall be capable of supporting a 200-pound (890 N) load without deformation.

(2) Rungs shall be evenly spaced from nine inches (22.9 cm) to sixteen and one-half inches (41.9 cm), center to center.

(3) Rungs shall be continuous members between rails. Each rung of a double-rung ladder (two side rails and a center rail) shall extend the full width of the ladder.

(4) Width between side rails at the base of the ladder shall be at least 12 inches (30.48 cm) for ladders 10 feet (3.05 m) or less in overall length, and shall increase at least one-fourth inch (0.64 cm) for each additional two feet (0.61 m) of ladder length.

(g) Portable manufactured ladders obtained after January 21, 1998 shall bear identification showing that they meet the appropriate ladder construction requirements of the following standards:

(1) ANSI A14.1-1990, Safety Requirements for Portable Wood Ladders;

(2) ANSI A14.2-1990, Safety Requirements for Portable Metal Ladders;

(3) ANSI A14.5-1992, Safety Requirements for Portable Reinforced Plastic Ladders.

(h) Job-made ladders shall:

(1) Have a uniform distance between rungs of at least 12 inches (30.48 cm) center to center;

(2) Be capable of supporting a 250-pound (1,112 N) load without deformation; and

(3) Have a minimum width between side rails of 12 inches (30.48 cm) for ladders 10 feet (3.05 m) or less in height. Width between rails shall increase at least one-fourth inch (0.64 cm) for each additional two feet (0.61 m) of ladder length.

(i) The employer shall:

(1) Maintain portable ladders in safe condition. Ladders with the following defects shall not be used, and shall either be tagged as unusable if kept on board, or shall be removed from the vessel:

(i) Broken, split or missing rungs, cleats or steps;

(ii) Broken or split side rails;

(iii) Missing or loose bolts, rivets or fastenings;

(iv) Defective ropes; or

(v) Any other structural defect.

(2) Ladders shall be inspected for defects before each day's use and after any occurrence, such as a fall, which could damage the ladder.

(j) Ladders shall be used in the following manner:

(1) Ladders shall be securely positioned on a level and firm base.

(2) Ladders shall be fitted with slip-resistant bases and/or be positively secured or held in place to prevent slipping or shifting while in use.

(3) Except for combination ladders, self-supporting ladders shall not be used as single straight ladders.

(4) Unless intended for cantilever operation, non-self-supporting ladders shall not be used to climb above the top support point.

(5) Ladders shall not be used:

(i) As guys, braces or skids; or

(ii) As platforms, runways or scaffolds.

(6) Metal and wire-reinforced ladders (even with wooden side rails) shall not be used when employees on the ladder might contact energized electrical conductors.

(7) Individual sections from different multi-sectional ladders or two or more single straight ladders shall not be tied or fastened together to achieve additional length.

(8) Single rail ladders (i.e. made by fastening rungs or devices across a single rail) shall not be used.

§1918.25—Bridge plates and ramps (See also §1918.86).

(a) *Bridge and car plates (dockboards).* Bridge and car plates used afloat shall be well maintained and shall:

- (1)** Be strong enough to support the loads imposed on them;
- (2)** Be secured or equipped with devices to prevent their dislodgement;
- (3)** Be equipped with hand holds or other effective means to permit safe handling; and
- (4)** Be designed, constructed, and maintained to prevent vehicles from running off the edge.³

(b) *Portable ramps.* Portable ramps used afloat shall be well maintained and shall:

- (1)** Be strong enough to support the loads imposed on them;
- (2)** Be equipped with a railing meeting the requirements of §1918.21(b), if the slope is more than 20 degrees to the horizontal or if employees could fall more than four feet (1.22 m);
- (3)** Be equipped with a slip resistant surface;
- (4)** Be properly secured; and
- (5)** Be designed, constructed, and maintained to prevent vehicles from running off the edge.⁴

³When the gap to be bridged is greater than 36 inches (.91 m), an acceptable means of preventing vehicles from running off the edge is a minimum side board height of two and three-quarter inches.

⁴When the gap to be bridged is greater than 36 inches (.91 m), an acceptable means of preventing vehicles from running off the edge is a minimum side board height of two and three-quarter inches.

§1918.26—Access to barges and river towboats.

(a) With the exception of §1918.25(b)(2), ramps used solely for vehicle access to or between barges shall meet the requirements of §1918.25.

(b) When employees cannot step safely to or from the wharf and a float, barge, or river towboat, either a ramp meeting the requirements of paragraph (a) of this section or a safe walkway meeting the requirements of §1918.22(f) shall be provided. When a ramp or walkway cannot be used, a straight ladder meeting the requirements of §1918.24 and extending at least three feet (0.91 m) above the upper landing surface and adequately secured or held against shifting or slipping shall be provided. When neither a walkway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of §1918.23 shall be provided. Exception: For barges operating on the Mississippi River System, where the employer shows that these requirements cannot reasonably be met due to local conditions, other safe means of access shall be provided.

(c) When a barge or raft is being worked alongside a larger vessel, a Jacob's ladder meeting the requirements of §1918.23 shall be provided for each gang working alongside unless other safe means of access is provided. However, no more than two Jacob's ladders are required for any single barge or raft being worked.

(d) When longshoring operations are in progress on barges, the barges shall be securely made fast to the vessel, wharf, or dolphins.

Subpart D—Working Surfaces

§1918.31—Hatch coverings.

(a) No cargo, dunnage, or other material shall be loaded or unloaded by means requiring the services of employees at any partially opened intermediate deck unless either the hatch at that deck is sufficiently covered or an adequate landing area suitable for the prevailing conditions exists. In no event shall such work be done unless the working area available for such employees extends for a distance of 10 feet (3.05 m) or more fore and aft and athwartships.

(b) Cargo shall not be landed on or handled over a covered hatch or 'tween-decks unless all hatch beams are in place under the hatch covers.

(c) Missing, broken, or poorly fitting hatch covers that would not protect employees shall be reported at once to the officer in charge of the vessel. Pending replacement or repairs by the vessel, work shall not be performed in the section containing the unsafe covers or in adjacent sections unless the flooring is made safe.

(d) Hatch covers and hatch beams not of uniform size shall be placed only in the hatch, deck, and section in which they fit properly.

(e) Small trimming hatches in intermediate decks shall be securely covered or guarded while work is going on in the hatch in which they are found, unless they are actually in use.

§1918.32—Stowed cargo and temporary landing surfaces.

(a) Temporary surfaces on which loads are to be landed shall be of sufficient size and strength to permit employees to work safely.

(b) When the edge of a hatch section or of stowed cargo may constitute a fall hazard to an employee, the edge shall be guarded by a vertical safety net, or other means providing equal protection, to prevent an employee from falling. When the employer can demonstrate that vertical nets or other equally effective means of guarding cannot be used due to the type of cargo, cargo stowage, or other circumstances, a trapeze net shall be rigged at the top edge of the elevation or other means shall be taken to prevent injury if an employee falls. Safety nets shall be maintained in good condition and be of adequate strength for the purpose intended.

(c) When two gangs are working in the same hatch on different levels, a vertical safety net shall be rigged and securely fastened to prevent employees or cargo from falling. Safety nets shall be maintained in good condition and be of adequate strength for the purpose intended.

§1918.33—Deck loads.

(a) Employees shall not be permitted to pass over or around deck loads unless there is a safe route of passage.

(b) Employees giving signals to crane operators shall not be permitted to walk over deck loads from rail to coaming unless there is a safe route of passage. If it is necessary to stand or walk at the outboard or inboard edge of the deck load having less than 24 inches (0.61 m) of bulwark, rail, coaming, or other protection, those employees shall be provided with protection against falling from the deck load.

§1918.34—Other decks.

(a) Cargo shall not be worked on decks that were not designed to support the load being worked.

(b) Grated decks shall be properly placed, supported, maintained and designed to support employees.

§1918.35—Open hatches.

Open weather deck hatches around which employees must work that are not protected to a height of 24 inches (0.61 m) by coamings shall be guarded by taut lines or barricades at a height of 36 inches (0.91 m) to 42 inches (1.07 m) above the deck, except on the side on which cargo is being worked. Any portable stanchions or uprights used shall be supported or secured to prevent accidental dislodgement.

§1918.36—Weather deck rails.

Removable weather deck rails shall be kept in place except when cargo operations require them to be removed, in which case they shall be replaced as soon as such cargo operations are completed.

§1918.37—Barges.

(a) Walking shall be prohibited along the sides of covered lighters or barges with coamings or cargo more than five feet (1.52 m) high unless a three-foot (.91 m) clear walkway or a grab rail or taut handline is provided.

(b) Walking or working shall be prohibited on the decks of barges to be loaded unless the walking or working surfaces have been determined by visual inspection to be structurally sound and maintained properly. If, while discharging a barge, an unsound deck surface is discovered, work shall be discontinued and shall not be resumed until means have been taken to ensure a safe work surface.

Subpart E—Opening and Closing Hatches

§1918.41—Coaming clearances.

(a) *Weather decks.* If a deck load (such as lumber or other smooth sided deck cargo) more than five feet (1.52 m) high is stowed within three feet (.91 m) of the hatch coaming and employees handling hatch beams and hatch covers are not protected by a coaming at least 24-inch (.61 m) high, a taut handline shall be provided along the side of the deckload. The requirements of §1918.35 are not intended to apply in this situation.

(b) *Intermediate decks.* (1) There shall be a three-foot (0.91 m) working space between the stowed cargo and the coaming at both sides and at one end of the hatches with athwartship hatch beams, and at both ends of those hatches with fore and aft hatch beams, before intermediate deck hatch covers and hatch beams are removed or replaced. Exception: The three-foot (0.91 m) clearance is not required on the covered portion of a partially open hatch, nor is it required when lower decks have been filled to hatch beam height with cargo of such a nature as to provide a safe surface upon which employees may work.

(2) For purposes of paragraph (b)(1) of this section, fitted gratings that are in good condition shall be considered a part of the decking when properly placed within the three-foot (0.91 m) area.

(c) Grab rails or taut handlines shall be provided for the protection of employees handling hatch beams and hatch covers, when bulkheads, lockers, reefer compartments or large spare parts are within three feet (0.91 m) of the coaming.

(d) The clearances in this section do not apply to hatches opened or closed solely by hydraulic or other mechanical means; except that, in all cases in which the three-foot (0.91 m) clearance does not exist, cargo that is stowed within three feet (0.91 m) of the edge of the hatch shall be adequately secured to prevent cargo from falling into the hold.

§1918.42—Hatch beams and pontoon bridles.

(a) Hatch beam and pontoon bridles shall be:

(1) Long enough to reach the holes, rings, or other lifting attachments on the hatch beams and pontoons easily;

(2) Of adequate strength to lift the load safely; and

(3) Properly maintained, including covering or blunting of protruding ends in wire rope splices.

(b) Bridles for lifting hatch beams shall be equipped with toggles, shackles, or hooks or other devices of such design that they cannot become accidentally dislodged from the hatch beams with which they are used. Hooks other than those described in this section may be used only when they are hooked into the standing part of the bridle. Toggles, when used, shall be at least one inch (2.54 cm) longer than twice the largest diameter of the holes into which they are placed.

(c) Bridles used for lifting pontoons and plugs shall have the number of legs required by the design of the pontoon or plug, and all of which shall be used. Where any use of a bridle requires fewer than the number of legs provided, idle legs shall be hung on the hook or ring, or otherwise prevented from swinging free.

(d) At least two legs of all strongback and pontoon bridles shall be equipped with a lanyard at least eight feet (2.44 m) long and in good condition. The bridle end of the lanyard shall be of chain or wire.

§1918.43—Handling hatch beams and covers.

NOTE: Paragraphs **(f)(2)**, **(g)**, and **(h)** of this section apply only to folding, sliding, or hinged metal hatch covers or to those hatch covers handled by cranes.

(a)(1) When hatch covers or pontoons are stowed on the weather deck abreast of hatches, they shall be arranged in stable piles not closer to the hatch coaming than three feet (0.91 m). Exception: On the working side of the hatch, hatch covers or pontoons may be spread one high between the coaming and bulwark with no space between them, provided the height of the hatch coaming is no less than 24 inches (0.61 m). Under no circumstances shall hatch covers or pontoons be stacked higher than the hatch coaming or bulwark on the working side of the hatch.

(2) On seagoing vessels, hatch boards or similar covers removed from the hatch beams in a section of partially opened hatch during cargo handling, cleaning or other operations shall not be stowed on the boards or covers left in place within that section.

(b) Hatch beams shall be laid on their sides, or stood on edge close together and lashed. Exception: This paragraph b shall not apply in cases where hatch beams are of such design that:

(1) The width of the flange is 50 percent or more of the height of the web; and

(2) The flange rests flat on the deck when the hatch beam is stood upright.

(c) Strongbacks, hatch covers, and pontoons removed from hatch openings and placed on the weather deck shall not obstruct clear fore- and-aft or coaming-to-bulwark passageways and shall be lashed or otherwise secured to prevent accidental dislodgement.

Dunnage or other suitable material shall be used under and between tiers of strongbacks and pontoons to prevent them from sliding when stowed on steel decks.

(d) Hatch covers unshipped in an intermediate deck shall be placed at least three feet (.91 m) from the coaming or they shall be removed to another deck. Strongbacks unshipped in an intermediate deck shall not be placed closer than six inches (15.24 cm) from the coaming and, if placed closer than three feet (.91 m), shall be secured so that they cannot be tipped or dragged into a lower compartment. If such placement or securement is not possible, strongbacks shall be removed to another deck.

(e) Any hatch beam or pontoon left in place next to an open hatch section being worked shall be locked or otherwise secured, so that it cannot be accidentally displaced. All portable, manually handled hatch covers, including those bound together to make a larger cover, shall be removed from any working section, and adjacent sections, unless securely lashed.

(f)(1) The roller hatch beam at the edge of the open section of the hatch shall be lashed or pinned back so that it cannot be moved toward the open section.

(2) Rolling, sectional or telescopic hatch covers of barges that open in a fore and aft direction shall be secured against unintentional movement while in the open position.

(g) Hinged or folding hatch covers normally stowed in an approximately vertical position shall be positively secured when in the upright position, unless the design of the system otherwise prevents unintentional movement.

(h) Hatches shall not be opened or closed while employees are in the square of the hatch below.

(i) All materials such as dunnage, lashings, twist locks, or stacking cones shall be removed from the hatch cover or be secured to prevent them from falling off the cover before the hatch cover is moved.

(j) When a hatch is to be covered, hatch covers or night tents shall be used. Any covering that only partially covers the hatch, such as alternate hatch covers or strips of dunnage, shall not be covered by a tarpaulin. Exception: A tarpaulin may be used to cover an open or partially open hatch to reduce dust emissions during bulk cargo loading operations, if positive means are taken to prevent employees from walking on the tarpaulin.

Subpart F—Vessel's Cargo Handling Gear

§1918.51—General requirements (See also §1918.11 and Appendix III of this part).

(a) The safe working load specified in the cargo gear certification papers or marked on the booms shall not be exceeded. Any limitations imposed by the certificating authority shall be followed.

(b) All components of cargo handling gear, including tent gantlines and associated rigging, shall be inspected by the employer or a designated person before each use and at appropriate intervals during use. Any gear that is found unsafe shall not be used until it is made safe.

(c) The employer shall determine the load ratings shown on the vessel's wire rope certificates for all wire rope and wire rope slings comprising part of ship's gear and shall observe these load ratings.

(d) The following limitations shall apply to the use of wire rope as a part of the ship's cargo handling gear:

(1) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections that the employer demonstrates will provide the same level of safety may be used;

(2) Except for eye splices in the ends of wires, each wire rope used in hoisting or lowering, in guying derricks, or as a topping lift, preventer, segment of a multi-part preventer, or pendant, shall consist of one continuous piece without knot or splice; and

(3) Wire rope and wire rope slings exhibiting any of the defects or conditions specified in §1918.62(b)(3)(i) through (vi) shall not be used.

(e) Natural and synthetic fiber rope slings exhibiting any of the defects or conditions specified in §1918.62(e)(1) through (7) shall not be used.

(f) Synthetic web slings exhibiting any of the defects or conditions specified in §1918.62(g)(2)(i) through (vi) shall not be used.

(g) Chains, including slings, exhibiting any of the defects or conditions specified in §1918.62(h)(3)(iii), (iv), or (h)(6) shall not be used.

§1918.52—Specific requirements.

(a) Preventers. (1) When preventers are used they shall be of sufficient strength for the intended purpose. They shall be secured to the head of the boom independent of working guys unless, for cast fittings, the strength of the fitting exceeds the total strength of all lines secured to it. Any tails, fittings, or other means of making the preventers fast on the deck shall provide strength equal to that of the preventer itself.

(2) Wire rope clips or knots shall not be used to form eyes in, nor to join sections of, preventer guys.

(b) Stoppers. (1) Chain topping lift stoppers shall be in good condition, equipped with fiber tails, and long enough to allow not fewer than three half-hitches in the chain.

(2) Chain stoppers shall be shackled or otherwise secured so that their links are not bent by being passed around fittings. The point of attachment shall be of sufficient strength and so placed that the stoppers are in line with the normal topping lift lead at the time the stopper is applied.

(3) Patent stoppers of the clamp type shall be appropriate for the size of the rope used. Clamps shall be in good condition and free of any substance that would prevent their being drawn tight.

(c) Falls. (1) The end of the winch fall shall be secured to the drum by clamps, U-bolts, shackles, or other equally strong methods. Fiber rope fastenings shall not be used.

(2) Winch falls shall not be used with fewer than three turns on the winch drum.

(3) Eyes in the ends of wire rope cargo falls shall not be formed by knots and, in single part falls, shall not be formed by wire rope clips.

(4) When the design of the winch permits, the fall shall be wound on the drum so that the cargo hook rises when the winch control lever is pulled back and lowers when the lever is pushed forward.

(d) Heel blocks. (1) When an employee works in the bight formed by the heel block, a preventer at least three-quarters of an inch (1.91 cm) in diameter wire rope shall be securely rigged, or equally effective means shall be taken, to hold the block and fall if the heel block attachments fail. Where physical limitations prohibit the fitting of a wire rope preventer of the required size, two turns of a one-half inch (1.27 cm) diameter wire rope shall be sufficient.

(2) If the heel block is not so rigged as to prevent its falling when not under strain, it shall be secured to prevent alternate raising and dropping of the block. This requirement shall not apply when the heel block is at least 10 feet (3.05 m) above the deck when at its lowest point.

(e) Coaming rollers. Portable coaming rollers shall be secured by wire preventers in addition to the regular coaming clamps.

(f) Cargo hooks. Cargo hooks shall be as close to the junction of the falls as the assembly permits, but never farther than two feet (.61 m) from it. Exception: This provision shall not apply when the

construction of the vessel and the operation in progress are such that fall angles are less than 120 degrees. Overhaul chains shall not be shortened by bolting or knotting.

§1918.53—Cargo winches.

(a) Moving parts of winches and other deck machinery shall be guarded.

(b) Winches shall not be used if control levers operate with excessive friction or excessive play.

(c) Double gear winches or other winches equipped with a clutch shall not be used unless a positive means of locking the gear shift is provided.

(d) There shall be no load other than the fall and cargo hook assembly on the winch when changing gears on a two-gear winch.

(e) Any defect or malfunction of winches that could endanger employees shall be reported immediately to the officer in charge of the vessel, and the winch shall not be used until the defect or malfunction is corrected.

(f) Temporary seats and shelters for winch drivers that create a hazard to the winch operator or other employees shall not be used.

(g) Except for short handles on wheel type controls, winch drivers shall not be permitted to use winch control extension levers unless they are provided by either the ship or the employer. Such levers shall be of adequate strength and securely fastened with metal connections at the fulcrum and at the permanent control lever.

(h) Extension control levers that tend to fall due to their own weight shall be counterbalanced.

(i) Winch brakes shall be monitored during use. If winch brakes are unable to hold the load, the winch shall be removed from service.

(j) Winches shall not be used when one or more control points, either hoisting or lowering, are not operating properly. Only authorized personnel shall adjust control systems.

(k) When winches are left unattended, control levers shall be placed in the neutral position and the power shall be shut off or control levers shall be locked at the winch or the operating controls.

§1918.54—Rigging gear.

(a) *Guy and preventer placement.* Each guy or preventer shall be placed to prevent it from making contact with any other guy, preventer, or stay.

(b) *Guys.* When alternate positions for securing guys are provided, the guys shall be so placed as to produce a minimum stress and not permit the boom to jackknife.

(c) *Boom placement.* The head of the midship boom shall be spotted no farther outboard of the coaming than is necessary for control of the load.

(d) *Preventers.* (1) Preventers shall be properly secured to suitable fittings other than those to which the guys are secured, and shall be as nearly parallel to the guys as the fittings will permit.

(2) Unless the cleat is also a chock and the hauling part is led through the chock opening, the leads of preventers to cleats shall be such that the direction of the line pull of the preventer is as parallel as possible to the plane of the surface on which the cleat is mounted.

(3) Guys and associated preventers shall be adjusted to share the load as equally as possible where cargo operations are being conducted by burtoning. Exception: Where guys are designed and intended for trimming purposes only, and the preventer is intended to do the function of the guy, the guy may be left slack.

(e) *Cargo falls.* Cargo falls under load shall not be permitted to chafe on any standing or other running rigging. **EXCEPTION:** Rigging shall not be construed to mean hatch coamings or other similar structural parts of the vessel.

(f) *Bull wire.* (1) Where a bull wire is taken to a winch head for lowering or topping a boom, the bull wire shall be secured to the winch head by shackle or other equally strong method. Securing by fiber rope fastening does not meet this requirement.

(2) When, in lowering or topping a boom, it is not possible to secure the bull wire to the winch head, or when the topping lift itself is taken to the winch head, at least five turns of wire shall be used.

(g) *Trimming and deckloads.* When deck loads extend above the rail and there is less than 12 inches (30.48 cm) horizontal clearance between the edge of the deck load and the inside of the bulwark or rail, a pendant or other alternate device shall be provided to allow trimming of the gear and to prevent employees from going over the side.

§1918.55—Cranes (See also §1918.11).

The following requirements shall apply to the use of cranes forming part of a vessel's permanent equipment.

(a) *Defects.* Cranes with a visible or known defect that affects safe operation shall not be used. Defects shall be reported immediately to the officer in charge of the vessel.

(b) *Operator's station.* (1) Cranes with missing, broken, cracked, scratched, or dirty glass (or equivalent) that impairs operator visibility shall not be used.

(2) Clothing, tools and equipment shall be stored so as not to interfere with access, operation or the operator's view.

(c) *Cargo operations.* (1) Accessible areas within the swing radius of the body of a revolving crane or within the travel of a shipboard

gantry crane shall be physically guarded or other equally effective means shall be taken during operations to prevent an employee from being caught between the body of the crane and any fixed structure, or between parts of the crane. Verbal warnings to employees to avoid the dangerous area do not meet this requirement.

(2) Limit switch bypass systems shall be secured during all cargo operations. Such bypass systems shall not be used except in an emergency or during non-cargo handling operations such as stowing cranes or derricks or performing repairs. Any time a bypass system is used, it shall be done only under the direction of an officer of the vessel.

(3) Under all operating conditions, at least three full turns of rope shall remain on ungrooved drums, and two full turns on grooved drums.

(4) Crane brakes shall be monitored during use. If crane brakes are unable to hold the load, the crane shall not be used.

(5) Cranes shall not be used if control levers operate with excessive friction or excessive play.

(6) When cranes are equipped with power down capability, there shall be no free fall of the gear when a load is attached.

(7) When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the gear and movements to be made.

(d) *Unattended cranes.* When cranes are left unattended between work periods, §1918.66(b)(4)(i) through (v) shall apply.

Subpart G—Cargo Handling Gear and Equipment Other Than Ship's Gear

§1918.61—General (See also Appendix IV of this part).

(a) *Employer provided gear inspection.* All gear and equipment provided by the employer shall be inspected by the employer or designated person before each use and, when appropriate, at intervals during its use, to ensure that it is safe. Any gear that is found upon such inspection to be unsafe shall not be used until it is made safe.

(b) *Safe working load.* **(1)** The safe working load of gear as specified in §1918.61 through §1918.66 shall not be exceeded.

(2) All cargo handling gear provided by the employer with a safe working load greater than five short tons (10,000 lbs. or 4.54 metric tons) shall have its safe working load plainly marked on it.

(c) *Gear weight markings.* The weight shall be plainly marked on any article of stevedoring gear hoisted by ship's gear and weighing more than 2,000 lbs. (0.91 metric tons).

(d) *Certification.* The employer shall not use any material handling device listed in paragraphs **(f)** and **(g)** of this section until the device has been certificated, as evidenced by current and valid documents attesting to compliance with the requirements of paragraph **(e)** of this section.

(e) *Certification procedures.* Each certification required by this section shall be performed in accordance with part 1919 of this chapter, by a person then currently accredited by OSHA as provided in that part.

(f) *Special gear.* **(1)** Special stevedoring gear provided by the employer, the strength of which depends upon components other than commonly used stock items such as shackles, ropes, or chains, and that has a Safe Working Load (SWL) greater than five short tons (10,000 lbs or 4.5 metric tons) shall be inspected and tested as

a unit before initial use (see Table A in paragraph (f)(2) of this section. In addition, any special stevedoring gear that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.

(2) Special stevedoring gear provided by the employer that has a SWL of five short tons (10,000 or 4.5 metric tons) or less shall be inspected and tested as a unit before initial use according to paragraphs (d) and (e) of this section or by a designated person (see Table A of this paragraph ((f)(2))).

Table A

Safe working load	Proof load
Up to 20 short tons (18.1 metric tons)	25 percent in excess
From 20 through 50 short tons (18.1 to 45.4 metric tons)	5 short tons in excess
Over 50 short tons (45.4 metric tons)	10 percent in excess

(g) Every spreader that is not a part of ship’s gear and is used for handling intermodal containers shall be inspected and tested before initial use to a proof load equal to 25 percent greater than its rated capacity. In addition, any spreader that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.

(h) All cargo handling gear covered by this section with a SWL greater than five short tons (10,000 lbs. or 4.54 metric tons) shall be proof load tested according to Table A in paragraph (f) or paragraph (g), as applicable, of this section every 4 years and in accordance with paragraphs (d) and (e) of this section or by a designated person.

(i) Certificates and inspection and test records attesting to the tests required by this section shall be available for inspection.

§1918.62—Miscellaneous auxiliary gear.

(a) *Routine inspection.* (1) At the completion of each use, loose gear such as slings, chains, bridles, blocks and hooks shall be so placed as to avoid damage to the gear. Loose gear shall be inspected and any defects corrected before reuse.

(2) Defective gear, as defined by the manufacturers' specifications (when available), shall not be used. Distorted hooks, shackles or similar gear shall be discarded.

NOTE TO PARAGRAPH (a): When manufacturers' specifications are not available to determine whether gear is defective, the employer shall use the appropriate paragraphs of this section to make these determinations.

(b) *Wire rope and wire rope slings.* (1) The employer shall follow the manufacturers' recommended ratings for wire rope and wire rope slings provided for use aboard ship, and shall have such ratings available for inspection. When the manufacturer is unable to supply such ratings, the employer shall use the tables for wire rope and wire rope slings found in Appendix II to this part. A design safety factor of at least five shall be maintained for the common sizes of running wire used as falls in purchases, or in such uses as light load slings.

(2) Wire rope with a safety factor of less than five may be used only as follows:

(i) In specialized equipment, such as cranes, designed to be used with lesser wire rope safety factors;

(ii) According to design factors in standing rigging applications; or

(iii) For heavy lifts or other purposes for which a safety factor of five is not feasible and for which the employer can show that equivalent safety is ensured.

(3) Wire rope or wire rope slings provided by the employer and having any of the following conditions shall not be used:

(i) Ten randomly distributed broken wires in one rope lay or three or more broken wires in one strand in one rope lay;

(ii) Kinking, crushing, bird caging or other damage resulting in distortion of the wire rope structure;

(iii) Evidence of heat damage;

(iv) Excessive wear or corrosion, deformation or other defect in the wire or attachments, including cracks in attachments;

(v) Any indication of strand or wire slippage in end attachments; or

(vi) More than one broken wire close to a socket or swaged fitting.

(4) Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Coverings shall be removable so that splices can be examined. Means used to cover or blunt ends shall not damage the wire.

(5) Where wire rope clips are used to form eyes, the employer shall follow the manufacturers' recommendations, which shall be available for inspection. If "U" bolt clips are used and the manufacturers' recommendations are not available, Table 1 of Appendix II to this part shall be used to determine the number and spacing of clips. "U" bolts shall be applied with the "U" section in contact with the dead end of the rope.

(6) Wire rope shall not be secured by knotting.

(7) Eyes in wire rope bridles, slings, bull wires, or in single parts used for hoisting shall not be formed by wire rope clips or knots.

(8) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope, and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections that the employer demonstrates to be equivalently safe may be used.

(9) Except for eye splices in the ends of wires and endless rope slings, each wire rope used in hoisting or lowering, or bulling cargo, shall consist of one continuous piece without knot or splice.

(c) *Natural fiber rope.* (1) The employer shall follow the manufacturers' recommended ratings for natural fiber rope and natural fiber rope slings provided for use aboard ship, and shall have such ratings available for inspection.

(2) If the manufacturers' recommended ratings and use recommendations are unavailable, the employer shall use Table 2 of Appendix II to this part to determine safe working loads of natural fiber rope slings comprising part of pre-slung drafts.

(3) Eye splices shall consist of at least three full tucks. Short splices shall consist of at least six tucks, three on each side of the centerline.

(d) *Synthetic rope.* (1) The employer shall follow the manufacturers' ratings and use recommendations for the specific synthetic fiber rope and synthetic fiber rope slings provided for use aboard ship, and shall have such ratings available for inspection.

(2) If the manufacturers' recommended ratings and use recommendations are unavailable, Tables 3A and B of Appendix II to this part shall be used to determine the safe working load of synthetic fiber rope and of synthetic rope slings that comprise this part of pre-slung drafts.

(3)(i) Unless otherwise recommended by the manufacturer, when synthetic fiber ropes are substituted for natural fiber ropes of less than three inches (7.62 cm) in circumference, the substitute shall be of equal size. Where substituted for natural fiber rope of three inches (7.62 cm) or more in circumference, the size of the synthetic rope shall be determined from the formula:

$$C = \pm \sqrt{0.6C_s^2 + 0.4C_m^2}$$

Where C = the required circumference of the synthetic rope in inches, Cs = the circumference to the nearest one-quarter inch (0.6 cm) of a synthetic rope having a breaking strength not less than

that of the size fiber rope that is required by paragraph (c) of this section, and C_m = the circumference of the fiber rope in inches that is required by paragraph (c) of this section.

(ii) In making such substitution, it shall be ascertained that the inherent characteristics of the synthetic fiber are suitable for hoisting.

(e) *Removal of natural and synthetic rope from service.* Natural and synthetic rope having any of the following defects shall be removed from service:

(1) Abnormal or excessive wear including heat and chemical damage;

(2) Powdered fiber between strands;

(3) Sufficient cut or broken fibers to affect the capability of the rope;

(4) Variations in the size or roundness of strands;

(5) Discolorations other than stains not associated with rope damage;

(6) Rotting; or

(7) Distortion or other damage to attached hardware.

(f) *Thimbles.* Properly fitting thimbles shall be used when any rope is secured permanently to a ring, shackle or attachment, where practicable.

(g) *Synthetic web slings.* (1) Slings and nets or other combinations of more than one piece of synthetic webbing assembled and used as a single unit (synthetic web slings) shall not be used to hoist loads greater than the sling's rated capacity.

(2) Synthetic web slings shall be removed from service if they exhibit any of the following defects:

- (i) Acid or caustic burns;
 - (ii) Melting or charring of any part of the sling surface;
 - (iii) Snags, punctures, tears or cuts;
 - (iv) Broken or worn stitches;
 - (v) Distortion or damage to fittings; or
 - (vi) Display of visible warning threads or markers designed to indicate excessive wear or damage.
- (3) Defective synthetic web slings removed from service shall not be returned to service unless repaired by a sling manufacturer or an entity of similar competence. Each repaired sling shall be proof tested by the repairer to twice the sling's rated capacity before its return to service. The employer shall retain a certificate of the proof test and make it available for inspection.
- (4) Synthetic web slings provided by the employer shall only be used according to the manufacturers' use recommendations, which shall be available.
- (5) Fittings shall have a breaking strength at least equal to that of the sling to which they are attached and shall be free of sharp edges.
- (h) *Chains and chain slings used for hoisting.* (1) The employer shall follow the manufacturers' recommended ratings for safe working loads for the size of wrought iron and alloy steel chains and chain slings and shall have such ratings available for inspection. When the manufacturer does not provide such ratings, the employer shall use Table 4A of Appendix II to this part to determine safe working loads for alloy steel chains and chain slings only.
- (2) Proof coil steel chain, also known as common or hardware chain, and other chain not recommended by the manufacturer for slinging or hoisting shall not be used for slinging or hoisting.

(3)(i) Sling chains, including end fastenings, shall be inspected for visible defects before each day's use and as often as necessary during use to ensure integrity of the sling.

(ii) Thorough inspections of chains in use shall be made quarterly to detect wear, defective welds, deformation or increase in length or stretch. The month of inspection shall be shown on each chain by color of paint on a link or by other equally effective means.

(iii) Chains shall be removed from service when maximum allowable wear, as indicated in Table 4B of Appendix II to this part, is reached at any point of a link.

(iv) Chain slings shall be removed from service when stretch has increased the length of a measured section by more than 5 percent; when a link is bent, twisted or otherwise damaged; or when a link has a raised scarf or defective weld.

(v) Only designated persons shall inspect chains used for slinging and hoisting.

(4) Chains shall only be repaired by a designated person. Links or portions of a chain defective under any of the criteria of paragraph **(h)(3)(iv)** of this section shall be replaced with properly dimensioned links or connections of material similar to that of the original chain. Before repaired chains are returned to service, they shall be tested to the proof test load recommended by the manufacturer for the original chain. Tests shall be done by the manufacturer or shall be certified by an agency accredited for the purpose under part 1919 of this chapter. Test certificates shall be available for inspection.

(5)(i) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding 6 months. Heat treatment certificates shall be available for inspection. Alloy chains shall not be annealed.

(ii) Any part of a lifting appliance or item of loose gear installed after January 21, 1998 shall not be manufactured of wrought iron.

(6) Kinked or knotted chains shall not be used for lifting. Chains shall not be shortened by bolting, wiring or knotting. Makeshift links or fasteners such as wire, bolts or rods shall not be used.

(7) Hooks, rings, links and attachments affixed to sling chains shall have rated capacities at least equal to those of the chains to which they are attached.

(8) Chain slings shall bear identification of size, grade and rated capacity.

(i) *Shackles.* (1) If the manufacturers' recommended safe working loads for shackles are available, they shall not be exceeded. If the manufacturers' recommendations are not available, Table 5 of Appendix II to this part shall apply.

(2) Screw pin shackles provided by the employer and used aloft, except in cargo hook assemblies, shall have their pins positively secured.

(j) *Hooks other than hand hooks.* (1) The manufacturers' recommended safe working loads for hooks shall not be exceeded. Hooks other than hand hooks shall be tested before initial use in accordance with the provisions of §1919.31, (a), (c) and (d) of this chapter. *Exception:* Manufacturers' test certificates indicating performance to the criteria in §1919.31 (a), (c), and (d) shall be acceptable.

(2) Bent or sprung hooks shall be discarded.

(3) Teeth of case hooks shall be maintained in safe condition.

(4) Jaws of patent clamp-type plate hooks shall be maintained in condition to grip plates securely.

(5) Loads shall be applied to the throat of the hook only.

(k) *Pallets.* (1) Pallets shall be made and maintained to support and carry loads being handled safely. Fastenings of reusable pallets used for hoisting shall be bolts and nuts, drive screws (helically

threaded nails), annular threaded nails or fastenings of equivalent holding strength.

(2) Reusable wing or lip-type pallets shall be hoisted by bar bridles or other suitable gear and shall have an overhanging wing or lip of at least three inches (7.6 cm). They shall not be hoisted by wire slings alone.

(3) Loaded pallets that do not meet the requirements of this paragraph shall be hoisted only after being placed on pallets meeting such requirements, or shall be handled by other means providing equivalent safety.

(4) Bridles for handling flush end or box-type pallets shall be designed to prevent disengagement from the pallet under load.

(5) Pallets shall be stacked or placed to prevent falling, collapsing or otherwise causing a hazard under standard operating conditions.

(6) Disposable pallets intended only for one use shall not be reused for hoisting

§1918.63—Chutes, gravity conveyors, and rollers.

(a) Chutes shall be of adequate length and strength to support the conditions of use, and shall be free of splinters and sharp edges.

(b) When necessary for the safety of employees, chutes shall be equipped with sideboards to afford protection from falling objects.

(c) When necessary for the safety of employees, provisions shall be made for stopping objects other than bulk commodities at the delivery end of the chute.

(d) Chutes and gravity conveyor roller sections shall be firmly placed and secured to prevent displacement, shifting, or falling.

(e) Gravity conveyors shall be of sufficient strength to support the weight of materials placed upon them safely. Conveyor rollers shall

be installed in a way that prevents them from falling or jumping out of the frame.

(f) Frames shall be kept free of burrs and sharp edges.

§1918.64—Forward conveyors.

(a) *Emergency stop.* Readily accessible stop controls shall be provided for use in an emergency. Whenever the operation of any power conveyor requires personnel to work close to the conveyor, the conveyor controls shall not be left unattended while the conveyor is in operation.

(b) *Guarding.* All conveyor and trimmer drives that create a hazard shall be adequately guarded.

(c) *Approved for location.* Electric motors and controls on conveyors and trimmers used to handle grain and exposed to grain dust shall be of a type approved by a nationally recognized testing laboratory for use in Class II, Division I locations. (See §1910.7 of this chapter.)

(d) *Grain trimmer control box.* Each grain trimmer shall have a control box on the weather deck close to the spout feeding the trimmer.

(e) *Grain trimmer power cable.* Power cables between the deck control box and the grain trimmer shall be used only in continuous lengths without splice or tap between connections.

(f) *Portable conveyors.* Portable conveyors shall be stable within their operating ranges. When used at variable fixed levels, the unit shall be secured at the operating level.

(g) *Delivery and braking.* When necessary for the safety of employees, provisions shall be made for braking objects at the delivery end of the conveyor.

(h) *Electric brakes.* Conveyors using electrically released brakes shall be constructed so that the brakes cannot be released until

power is applied and the brakes are automatically engaged if the power fails or the operating control is returned to the “stop” position.

(i) *Starting powered conveyors.* Powered conveyors shall not be started until all employees are clear of the conveyor or have been warned that the conveyor is about to start up.

(j) *Loading and unloading.* The area around conveyor loading and unloading points shall be kept clear of obstructions during conveyor operations.

(k) *Lockout/tagout.* **(1)** Conveyors shall be stopped and their power sources locked out and tagged out during maintenance, repair, and servicing. If power is necessary for testing or for making minor adjustments, power shall only be supplied to the servicing operation.

(2) The starting device shall be locked out and tagged out in the stop position before an attempt is made to remove the cause of a jam or overload of the conveying medium.

(l) *Safe practices.* **(1)** Only designated persons shall operate, repair or service powered conveyors.

(2) The employer shall ensure that each employee stays off operating conveyors.

(3) Conveyors shall be operated only with all overload devices, guards and safety devices in place and operable.

§1918.65—Mechanically powered vehicles used aboard vessels.

(a) *Applicability.* This section applies to every type of mechanically powered vehicle used for material or equipment handling aboard a vessel.

(b) *General.* **(1)** Modifications, such as adding counterweights that might affect the vehicle’s capacity or safety, shall not be done

without either the manufacturers' prior written approval or the written approval of a registered professional engineer experienced with the equipment, who has consulted with the manufacturer, if available. Capacity, operation and maintenance instruction plates, tags or decals shall be changed to conform to the equipment as modified.

(2) Rated capacities, with and without removable counterweights, shall not be exceeded. Rated capacities shall be marked on the vehicle and shall be visible to the operator. The vehicle weight, with and without a counterweight, shall be similarly marked.

(3) If loads are lifted by two or more trucks working in unison, the total weight shall not exceed the combined safe lifting capacity of all trucks.

(c) Guards for fork lift trucks. (1) Except as noted in paragraph (c)(5) of this section, fork lift trucks shall be equipped with overhead guards securely attached to the machines. The guard shall be of such design and construction as to protect the operator from boxes, cartons, packages, bagged material, and other similar items of cargo that might fall from the load being handled or from stowage.

(2) Overhead guards shall not obstruct the operator's view, and openings in the top of the guard shall not exceed six inches (15.24 cm) in one of the two directions, width or length. Larger openings are permitted if no opening allows the smallest unit of cargo being handled through the guard.

(3) Overhead guards shall be built so that failure of the vehicle's mast tilting mechanism will not displace the guard.

(4) Overhead guards shall be large enough to extend over the operator during all truck operations, including forward tilt.

(5) An overhead guard may be removed only when it would prevent a truck from entering a work space and only if the operator is not exposed to low overhead obstructions in the work space.

(6) Where necessary to protect the operator, fork lift trucks shall be fitted with a vertical load backrest extension to prevent the load from hitting the mast when the mast is positioned at maximum backward tilt. For this purpose, a “load backrest extension” means a device extending vertically from the fork carriage frame to prevent raised loads from falling backward.

(d) Guards for bulk cargo-moving vehicles. (1) Every crawler type, rider operated, bulk cargo-moving vehicle shall be equipped with an operator’s guard of such design and construction as to protect the operator, when seated, against injury from contact with a projecting overhead hazard.

(2) Overhead guards and their attachment points shall be so designed as to be able to withstand, without excessive deflection, a load applied horizontally at the operator’s shoulder level equal to the drawbar pull of the machine.

(3) Overhead guards are not required when the vehicle is used in situations in which the seated operator cannot contact projecting overhead hazards.

(4) After July 26, 1999, bulk cargo-moving vehicles shall be equipped with rollover protection of such design and construction as to prevent the possibility of the operator being crushed because of a rollover or upset.

(e) Approved trucks. (1) “Approved power-operated industrial truck” means one listed as approved for the intended use or location by a nationally recognized testing laboratory (see §1910.7 of this chapter).

(2) Approved power-operated industrial trucks shall bear a label or other identification indicating testing laboratory approval.

(3) When the atmosphere in an area is hazardous (see §1918.2 and §1918.93), only approved power-operated industrial trucks shall be used.

(f) Maintenance. (1) Mechanically powered vehicles shall be maintained in safe working order. Safety devices shall not be removed or made inoperative except where permitted in this section. Vehicles with a fuel system leak or any other safety defect shall not be operated.

(2) Braking systems or other mechanisms used for braking shall be operable and in safe condition.

(3) Replacement parts whose function might affect operational safety shall be equivalent in strength and performance capability to the original parts that they replace.

(4) Repairs to the fuel and ignition systems of mechanically powered vehicles that involve fire hazards shall be conducted only in locations designated as safe for such repairs.

(5) Batteries on all mechanically powered vehicles shall be disconnected during repairs to the primary electrical system except when power is necessary for testing and repair. On vehicles equipped with systems capable of storing residual energy, that energy shall be safely discharged before work on the primary electrical system begins.

(6) Only designated persons shall do maintenance and repair.

(g) Parking brakes. All mechanically powered vehicles purchased after January 21, 1998, shall be equipped with parking brakes.

(h) Operation. (1) Only stable and safely arranged loads within the rated capacity of the mechanically powered vehicle shall be handled.

(2) The employer shall require drivers to ascend and descend grades slowly.

(3) If the load obstructs the forward view, the employer shall require drivers to travel with the load trailing.

- (4) Steering knobs shall not be used unless the vehicle is equipped with power steering.
- (5) When mechanically powered vehicles use cargo lifting devices that have a means of engagement hidden from the operator, a means shall be provided to enable the operator to determine that the cargo has been engaged.
- (6) No load on a mechanically powered vehicle shall be suspended or swung over any employee.
- (7) When mechanically powered vehicles are used, provisions shall be made to ensure that the working surface can support the vehicle and load, and that hatch covers, truck plates, or other temporary surfaces cannot be dislodged by movement of the vehicle.
- (8) When mechanically powered vehicles are left unattended, load-engaging means shall be fully lowered, controls neutralized, brakes set and power shut off. Wheels shall be blocked or curbed if the vehicle is on an incline.
- (9) When lift trucks or other mechanically powered vehicles are being operated on open deck-type barges, the edges of the barges shall be guarded by railings, sideboards, timbers, or other means sufficient to prevent vehicles from rolling overboard. When such vehicles are operated on covered lighters where door openings other than those being used are left open, means shall be provided to prevent vehicles from rolling overboard through such openings.
- (10) Unauthorized personnel shall not ride on mechanically powered vehicles. A safe place to ride shall be provided when riding is authorized.
- (11) An employee may be elevated by fork lift trucks only when a platform is secured to the lifting carriage or forks. The platform shall meet the following requirements:
- (i) The platform shall have a railing complying with §1917.112(c) of this chapter.

(ii) The platform shall have toeboards complying with §1917.112(d) of this chapter, if tools or other objects could fall on employees below.

(iii) When the truck has controls elevated with the lifting carriage, means shall be provided for employees on the platform to shut off power to the vehicle.

(iv) Employees on the platform shall be protected from exposure to moving truck parts.

(v) The platform floor shall be skid resistant.

(vi) An employee shall be at the truck's controls whenever employees are elevated.

(vii) While an employee is elevated, the truck may be moved only to make minor adjustments in placement.

§1918.66—Cranes and derricks other than vessels' gear.

(a) *General.* The following requirements shall apply to the use of cranes and derricks brought aboard vessels for conducting longshoring operations. They shall not apply to cranes and derricks forming part of a vessel's permanent equipment.

(1) *Certification.* Cranes and derricks shall be certificated in accordance with part 1919 of this chapter.

(2) *Posted weight.* The crane weight shall be posted on all cranes hoisted aboard vessels for temporary use.

(3) *Rating chart.* All cranes and derricks having ratings that vary with boom length, radius (outreach) or other variables shall have a durable rating chart visible to the operator, covering the complete range of the manufacturers' (or design) capacity ratings. The rating chart shall include all operating radii (outreach) for all permissible boom lengths and jib lengths, as applicable, with and without outriggers, and alternate ratings for optional equipment affecting

such ratings. Precautions or warnings specified by the owner or manufacturer shall be included along with the chart.

(4) *Rated loads.* The manufacturers' (or design) rated loads for the conditions of use shall not be exceeded.

(5) *Change of rated loads.* Designated working loads shall not be increased beyond the manufacturers' ratings or original design limitations unless such increase receives the manufacturers' approval. When the manufacturers' services are not available or where the equipment is of foreign manufacture, engineering design analysis shall be done or approved by a person accredited for certificating the equipment under part 1919 of this chapter. Engineering design analysis shall be done by a registered professional engineer competent in the field of cranes and derricks. Any structural changes required by the change in rating shall be carried out.

(6) *Radius indicator.* When the rated load varies with the boom radius, the crane or derrick shall be fitted with a boom angle or radius indicator visible to the operator.

(7) *Operator's station.* The cab, controls and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signalman, when one is used. Cab glass, when used, shall be safety plate glass or equivalent. Cranes with missing, broken, cracked, scratched, or dirty glass (or equivalent), that impairs operator vision shall not be used. Clothing, tools, and equipment shall be stored so as not to interfere with access, operation, and the operator's view.

(8) *Counterweights or ballast.* Cranes shall be operated only with the specified type and amount of ballast or counterweights. Ballast or counterweights shall be located and secured only as provided in the manufacturers' or design specifications, which shall be available for inspection.

(9) *Outriggers.* Outriggers shall be used according to the manufacturers' specifications or design data, which shall be available for inspection. Floats, when used, shall be securely attached to the

outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety, and of sufficient width and length to prevent the crane from shifting or toppling under load.

(10) Exhaust gases. Engine exhaust gases shall be discharged away from crane operating personnel.

(11) Electrical/Guarding. Electrical equipment shall be so placed or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair; otherwise the equipment shall be stopped and its power source locked out and tagged out.

(12) Fire extinguisher. (i) At least one portable approved or listed fire extinguisher of at least a 5-B:C rating or equivalent shall be accessible in the cab of the crane or derrick.

(ii) No portable fire extinguisher using carbon tetrachloride or chlorobromomethane extinguishing agents shall be used.

(13) Rope on drums. At least three full turns of rope shall remain on ungrooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by clamps, U-bolts, shackles or equivalent means. Fiber rope fastenings are prohibited.

(14) Brakes. (i) Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applied directly to the motor shaft or gear train.

(ii) Each independent hoisting unit of a crane shall, in addition to the holding brake, be equipped with a controlled braking means to control lowering speeds.

(iii) Holding brakes for hoist units shall have not less than the following percentage of the rated load hoisting torque at the point where the brake is applied:

(A) 125 percent when used with an other than mechanically controlled braking means; or

(B) 100 percent when used with a mechanically controlled braking means; or

(C) 100 percent when two holding brakes are provided.

(iv) All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

(15) *Operating controls.* Crane and derrick operating controls shall be clearly marked, or a chart showing their function shall be posted at the operator's position.

(16) *Booms.* Cranes with elevatable booms and without operable automatic limiting devices shall be provided with boom stops if boom elevation can exceed maximum design angles from the horizontal.

(17) *Foot pedals.* Foot pedals shall have a non-skid surface.

(18) *Access.* Ladders, stairways, stanchions, grab irons, foot steps or equivalent means shall be provided as necessary to ensure safe access to footwalks, cab platforms, the cab and any portion of the superstructure that employees must reach.

(b) *Operations.* (1) *Use of cranes together.* When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the load and movements to be made.

(2) *Guarding of swing radius.* Accessible areas within the swing radius of the body of a revolving crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure or between parts of the crane.

(3) Prohibited usage. (i) Equipment shall not be used in a way that exerts side loading stresses upon the crane or derrick boom.

(ii) No crane or derrick having a visible or known defect that may affect safe operation shall be used.

(4) Unattended cranes. The following steps shall be taken before leaving a crane unattended between work periods:

(i) Suspended loads, such as those hoisted by lifting magnets or clamshell buckets, shall be landed unless the storage position or maximum hoisting of the suspended device will provide equivalent safety;

(ii) Clutches shall be disengaged;

(iii) The power supply shall be shut off;

(iv) The crane shall be secured against accidental travel; and

(v) The boom shall be lowered or secured against movement.

(c) Protection for employees being hoisted. (1) No employee shall be hoisted by the load hoisting apparatus of a crane or derrick except on a platform meeting the following requirements:

(i) Enclosed by a railing or other means providing protection equivalent to that described in §1917.112(c) of this chapter;

(ii) Fitted with toe boards if the platform has open railings;

(iii) A safety factor of four based on ultimate strength;

(iv) Bearing a plate or permanent marking indicating maximum load rating, which shall not be exceeded, and the weight of the platform itself;

(v) Equipped with a device to prevent access doors, when used, from opening accidentally;

(vi) Equipped with overhead protection for employees on the platform if they are exposed to falling objects or overhead hazards; and

(vii) Secured to the load line by means other than wedge and socket attachments, unless the free (bitter) end of the line is secured back to itself by a clamp placed as close above the wedge as possible.

(2) Except in an emergency, the hoisting mechanism of all cranes or derricks used to hoist personnel shall operate only in power up and power down, with automatic brake application when not hoisting or lowering.

(3) All cranes and derricks used to hoist personnel shall be equipped with an anti-two-blocking device.

(4) Variable radius booms of a crane or derrick used to hoist personnel shall be so constructed or secured as to prevent accidental boom movement.

(5) Platforms or devices used to hoist employees shall be inspected for defects before each day's use and shall be removed from service if defective.

(6) Employees being hoisted shall remain in continuous sight of and communication with the operator or signalman.

(7) Operators shall remain at the controls when employees are hoisted.

(8) Cranes shall not travel while employees are hoisted, except in emergencies or in normal tier-to-tier transfer of employees during container operations.

(d) *Routine inspection.* (1) Designated persons shall visually inspect each crane and derrick on each day of use for defects in functional operating components and shall report any defect found to the employer. The employer shall inform the operator of the result of the inspection.

(2) A designated person shall thoroughly inspect all functional components and accessible structural features of each crane or device at monthly intervals.

(3) Any defects found during such inspections that may create a safety hazard shall be corrected before further equipment use. Repairs shall be done only by designated persons.

(4) A record of each monthly inspection shall be maintained for six months in or on the crane or derrick or at the terminal.

(e) Protective devices. **(1)** When exposed moving parts such as gears, chains and chain sprockets present a hazard to employees during crane and derrick operations, those parts shall be securely guarded.

(2) Crane hooks shall be latched or otherwise secured to prevent accidental load disengagement.

(f) Load-indicating devices. **(1)** Unless exempted by the provisions of paragraph **(f)(1)(viii)** of this section, every crane used to load or discharge cargo into or out of a vessel shall be fitted with a load-indicating device or alternative device in proper working condition that shall meet the following criteria:

(i) The type or model of any load-indicating device used shall be such as to provide:

(A) A direct indication in the cab of actual weight hoisted or a means of determining this by reference to crane ratings posted and visible to the operator, except that the use of a dynamometer or simple scale alone will not meet this requirement; or

(B) An automatic weight-moment device (e.g., a computer) providing indications in the cab according to the radius and load at the moment; or

(C) A device that will prevent an overloaded condition.

(ii) The accuracy of the load-indicating device, weight-moment device, or overload protection device shall be such that any indicated load (or limit), including the sum of actual weight hoisted and additional equipment or “add ons” such as slings, sensors, blocks, etc., is within the range between 95 percent (5 percent underload) and 110 percent (10 percent overload) of the actual true total load. Such accuracy shall be required over the range of daily operating variables reasonably anticipated under the conditions of use.

(iii) The device shall enable the operator to decide before making any lift that the load indicating device or alternative device is operative. In the alternative, if the device is not so mounted or attached and does not include such means of checking, it shall be certified by the manufacturer to remain operative for a specific time. The device shall be checked for accuracy, using known values of the load, at the time of every certification survey (see §1918.11) and at such additional times as may be recommended by the manufacturer.

(iv) When the load indicating device or alternative device is so arranged in the supporting system (crane structure) that its failure could cause the load to be dropped, its strength shall not be the limiting factor of the supporting system (crane structure).

(v) Units of measure in pounds or both pounds and kilograms (or other indicators of measurement, such as colored indicator lights), capacity of the indicating system, accuracy of the indicating system, and operating instructions and precautions shall be conspicuously marked. If the system used provides no readout but automatically ceases crane operation when the rated load limit is reached under any specific condition of use, the marking shall provide the make and model of the device installed, a description of what it does, how it is operated, and any necessary precautions regarding the system. All of these markings shall be readily visible to the operator.

(vi) All load indicating devices shall operate over the full operating radius. Overall accuracy shall be based on actual applied loads and not on full scale (full capacity) load.

NOTE TO PARAGRAPH (f)(1)(vi): If the accuracy of the load indicating device is based on full scale loads and the device is arbitrarily set at plus or minus 10 percent, it would accept a reading between 90,000 lbs. and 110,000 lbs. at full capacity for a machine with a maximum rating of 100,000 lbs. but would also show a reading of between zero and 20,000 lbs. at that outreach (radius) at which the load would be 10,000 lbs; this is clearly unacceptable. If, however, the accuracy of the device is based on actual applied loads under the same conditions, the acceptable range would remain the same with the 100,000 load but would show a figure between 9,000 lbs. and 11,000 lbs. at the 10,000 lb. load; this is an acceptable reading.

(vii) When a load-indicating device uses the radius as a factor in its use or in its operating indications, the indicated radius (which may be in feet and/or meters, or degrees of boom angle, depending on the system used) shall be within the range between 97 percent and 110 percent of the actual (true) radius. When radius is presented in degrees, and feet or meters are required for necessary determinations, a conversion chart shall be provided.

(viii) The load indicating device requirements of this paragraph do not apply to a crane:

(A) Of the trolley equipped bridge type while handling containers known to be and identified as empty, or loaded, and in either case according to the provisions of §1918.85(b) of this part, or while hoisting other lifts by means of a lifting beam supplied by the crane manufacturer for the purpose and in all cases within the crane rating;

(B) While handling bulk commodities or cargoes by means of clamshell bucket or magnet;

(C) While used to handle or hold hoses in connection with transfer of bulk liquids, or other hose-handled products; or

(D) While the crane is used exclusively to handle cargo or equipment whose total actual gross weight is marked on the unit or units hoisted, and the total actual gross weight never exceeds

11,200 lbs., and the load is less than the rated capacity of the crane at the maximum outreach possible at the time.

(2) [Reserved]

§1918.67—Notifying the ship's officers before using certain equipment.

(a) The employer shall notify the officer in charge of the vessel before bringing aboard ship internal combustion or electric powered tools, equipment or vehicles.

(b) The employer shall also notify the officer in charge of the vessel before using the ship's electric power for the operation of any electric tools or equipment.

§1918.68—Grounding.

The frames of portable electrical equipment and tools, other than double insulated tools and battery operated tools, shall be grounded through a separate equipment conductor run with or enclosing the circuit conductors.

§1918.69—Tools.

(a) General. Employers shall not issue or permit the use of visibly unsafe tools.

(b) Portable electric tools. (1) Portable hand-held electric tools shall be equipped with switches of a type that must be manually held in a closed position in order to operate the tool.

(2) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work,

the lower guard shall automatically and instantly return to the covering position.

Subpart H—Handling Cargo

§1918.81—Slinging.

(a) Drafts shall be safely slung before being hoisted. Loose dunnage or debris hanging or protruding from loads shall be removed.

(b) Cargo handling bridles, such as pallet bridles, which are to remain attached to the hoisting gear while hoisting successive drafts, shall be attached by shackles, or other positive means shall be taken to prevent them from being accidentally disengaged from the cargo hook.

(c) Drafts of lumber, pipe, dunnage and other pieces, the top layer of which is not bound by the sling, shall be slung in a way that prevents sliders. Double slings shall be used on unstrapped dunnage, unless, due to the size of hatch or deep tank openings, using them is impracticable.

(d) Case hooks shall be used only with cases designed to be hoisted by these hooks.

(e) Bales of cotton, wool, cork, wood pulp, gunny bags or similar articles shall not be hoisted by straps unless the straps are strong enough to support the weight of the bale. At least two hooks, each in a separate strap, shall be used.

(f) Unitized loads bound by bands or straps may be hoisted by the banding or strapping only if the banding or strapping is suitable for hoisting and is strong enough to support the weight of the load.

(g) Additional means to maintain the unitized loads during hoisting shall be employed to ensure safe lifting of such loads having damaged banding or strapping.

(h) Loads requiring continuous manual guidance during handling shall be guided by guide ropes (tag lines) that are long enough to control the load.

(i) No draft shall be hoisted unless the winch or crane operator(s) can clearly see the draft itself or see the signals of a signalman who is observing the draft's movement.

(j) Intermodal containers shall be handled in accordance with §1918.85.

(k) The employer shall require that employees stay clear of the area beneath overhead drafts or descending lifting gear.

(l) The employer shall not permit employees to ride the hook or the load, except as provided for in §1918.85(g).

§1918.82—Building drafts.

(a) Drafts shall be built or means shall be taken to prevent cargo from falling from them.

(b) Buckets and tubs used in handling bulk or frozen cargo shall not be loaded above their rims.

§1918.83—Stowed cargo; tiering and breaking down.

(a) When necessary to protect personnel working in a hold, the employer shall secure or block stowed cargo that is likely to shift or roll.

(b) In breaking down stowed cargo, precautions shall be taken to prevent remaining cargo from falling.

(c) Employees trimming bulk cargo shall be checked in and out by the job boss. Before securing any reefer compartment, a check shall be made to ensure that no employee remains inside. Frequent checks shall be made to ensure the safety of any employee working alone in a tank or cargo compartment.

§1918.84—Bulling cargo.

(a) Bulling cargo shall be done with the bull line led directly from the heel block. However, bulling may be done from the head of the boom when the nature of the cargo and the surface over which it is dragged are such that the load cannot be stalled, or when the winch actually does not have sufficient strength, with the purchase used, to overload the boom.

(b) Snatch blocks shall be used to provide a fair lead for the bull line to avoid unnecessary dragging of the bull line against coamings and obstructions.

(c) Snatch blocks shall not be used with the point of the hook resting on the flange of a beam, but shall be hung from padeyes, straps, or beam clamps. Snatch blocks or straps shall not be made fast to batten cleats or other insecure fittings.

(d) Beam frame clamps shall be so secured as to prevent their slipping, falling, or being pulled from their stationary attachment.

(e) Falls led from cargo booms of vessels shall not be used to move scows, lighters or railcars.

§1918.85—Containerized cargo operations.

(a) *Container markings.* Every intermodal container shall be legibly and permanently marked with:

(1) The weight of the container when empty, in pounds;

(2) The maximum cargo weight the container is designed to carry, in pounds; and

(3) The sum of the weight of the container and the maximum cargo weight, in pounds.

(b) *Container weight.* No container shall be hoisted by any lifting appliance unless the following conditions have been met:

(1) The employer shall determine from the carrier whether a container to be hoisted is loaded or empty. Before loading or discharging, empty containers shall be identified in a manner that will inform every supervisor and job boss on the site and in charge of loading or discharging, or every crane or other hoisting equipment operator and signalman, that such container is empty. Methods of identification may include cargo plans, manifests, or markings on the container.

(2) For a loaded container:

(i) The actual gross weight shall be plainly marked and visible to the crane or other hoisting equipment operator or signalman, or to every supervisor or job boss on site and in charge of the operation; or

(ii) The cargo stowage plan or equivalent permanently recorded display serving the same purpose, containing the actual gross weight and the serial number or other positive identification of that specific container, shall be provided to the crane or other hoisting equipment operator and signalman, and to every supervisor and job boss on site and in charge of the operation.

(3) Every outbound container received at a marine terminal ready to load aboard a vessel without further consolidation or loading shall be weighed to obtain the actual gross weight, either at the terminal or elsewhere, before being hoisted.

(4)(i) When container weighing scales are found at a marine terminal, any outbound container with a load consolidated at that terminal shall be weighed to obtain the actual weight before being hoisted.

(ii) If the terminal has no scales, the actual gross weight may be calculated from the container's contents and the container's empty weight. The weights used in the calculation shall be posted conspicuously on the container, with the name of the person making the calculation, and the date.

(5) Open top vehicle-carrying containers, and those built specifically and used solely for the carriage of compressed gases, are excepted from paragraphs **(b)(3)** and **(b)(4)** of this section.

(6) Closed dry van containers carrying vehicles are exempted from paragraph **(b)(4)** of this section if:

(i) The container carries only completely assembled vehicles and no other cargo;

(ii) The container is marked on the outside so that an employee can readily discern that the container is carrying vehicles; and

(iii) The vehicles were loaded into the container at the marine terminal.

(7) The weight of loaded inbound containers from foreign ports shall be determined by weighing, by the method of calculation described in paragraph **(b)(4)(ii)** of this section or by shipping documents.

(8) Any scale used within the United States to weigh containers for the requirements of this section shall meet the accuracy standards of the state or local public authority in which the scale is found.

(c) *Overloaded containers.* No container shall be hoisted if its actual gross weight exceeds the weight marked as required in paragraph **(a)(3)** of this section, or it exceeds the capacity of the lifting appliance.

(d) *Container inspection.* **(1)** Prior to hoisting, each container shall be inspected for any visible defects in structural members and fittings that would make the handling of such container unsafe.

(2) Any container found to have such a defect shall either be handled by a special means to ensure safe handling or shall be emptied before handling.

(e) *Suspended containers.* The employer shall prohibit employees from working beneath a suspended container.

(f) *Lifting fittings.* Containers shall be handled using lifting fittings or other arrangements suitable and intended for the purpose as set forth in paragraphs **(f)(1)** and **(f)(2)** of this section, unless damage to an intermodal container makes special means of handling necessary.

(1) *Loaded intermodal containers.* Loaded intermodal containers of 20 feet (6.1 m) or more shall be hoisted as follows:

(i) When hoisting containers by the top fittings, the lifting forces shall be applied vertically from at least four such fittings. A less than vertical lift is permitted only under the following conditions:

(A) The container being lifted is an ISO “closed box container”;

(B) The condition of the box is sound;

(C) The speed of hoisting and lowering is moderated when heavily laden containers⁵ are encountered;

(D) The lift angle is at 80 to 90 degrees;

(E) The distance between the lifting beam and the load is at least 8 feet, 2.4 inches (2.5 m); and

(F) The length of the spreader beam is at least 16.3 feet (5 m) for a 20-foot container, and at least 36.4 feet (11.1 m) for a 40-foot container.

(ii) When hoisting containers from bottom fittings, the hoisting connections shall bear on the fittings only, making no other contact with the container. The angles of the four bridle legs shall not be less than 30 degrees to the horizontal for 40-foot (12.19 m)

⁵ A heavily laden container is one that is loaded to within 20 percent of its rated capacity.

containers; 37 degrees for 30-foot (9.14 m) containers; and 45 degrees for 20-foot (6.1 m) containers.

(iii) Lifting containers by fork lift trucks or grappling arms from above or from one side may be done only if the container is designed for this type of handling.

(iv) Other means of hoisting may be used only if the containers and hoisting means are designed for such use.

(2) Intermodal container spreaders. **(i)** When using intermodal container spreaders that employ lanyards for activation and load disengagement, all possible precautions shall be taken to prevent accidental release of the load.

(ii) Intermodal container spreaders that utilize automatic twist lock systems shall be designed and used so that a suspended load cannot accidentally be released.

(g) Safe container top access. A safe means of access shall be provided for each employee required to work on the top of an intermodal container. Unless ladders are used for access, such means shall comply with the requirements of §1917.45(j) of this chapter.

(h) Employee hoisting prohibition. Employees shall not be hoisted on intermodal container spreaders while a load is engaged.

(i) Portable ladder access. When other safer means are available, portable ladders shall not be used in gaining access to container stacks more than two containers high.

(j) Fall protection. **(1)** Containers being handled by container gantry cranes.

(i) After July 26, 1999, where a container gantry crane is being used to handle containers, the employer shall ensure that no employee is on top of a container. Exception: An employee may be on top of a container only to perform a necessary function that

cannot be eliminated by the use of positive container securing devices.⁶

(ii) After July 26, 1999, the employer shall ensure that positive container securing devices, such as semi-automatic twist locks and above deck cell guides, are used wherever container gantry cranes are used to hoist containers.

(iii) The employer shall ensure that each employee on top of a container is protected from fall hazards by a fall protection system meeting the requirements of paragraph (k) of this section.

(2) *Containers being handled by other hoisting devices.* Where containers are being handled by hoisting devices other than container gantry cranes, the employer shall ensure that each employee on top of a container is protected by a fall protection system meeting the requirements of paragraph (k) of this section.

(3) *Other exposures to fall hazards.* The employer shall ensure that each employee exposed to a fall hazard is protected by a fall protection system meeting the requirements of paragraph (k) of this section. Exception: Where the employer can demonstrate that fall protection for an employee would be infeasible or create a greater hazard due to vessel design, container design, container storage, other cargo stowage, container handling equipment, lifting gear, or port conditions, the employer shall alert the affected employee about the fall hazard and instruct the employee in ways to minimize exposure to that hazard.

(k) *Fall protection systems.* When fall protection systems required by paragraph (j) of this section are employed, the following shall apply:

(1) Each fall protection system component, except anchorages, shall have fall arrest/restraint as its only use.

⁶Examples of work that may not be eliminated by positive container securing devices and that may require employees to work on top of containers include, but are not limited to: installing or removing bridge clamps; hooking up or detaching over-height containers; freeing a jammed semi-automatic twist lock.

(2) Each fall protection system subjected to impact loading shall be immediately withdrawn from service and not be used again until inspected and determined by a designated person to be undamaged and suitable for use.

(3) Each fall protection system shall be rigged so that a falling employee cannot contact any lower level stowage or vessel structure.

(4) Each fall protection system adopted for use shall have an energy absorbing mechanism that will produce an arresting force on an employee of not greater than 1800 pounds (8 kN).

(5) Each component of a fall protection system shall be designed and used to prevent accidental disengagement.

(6) Each fall protection system's fixed anchorages shall be capable of sustaining a force of 5,000 pounds (22.2 kN) or be certified as capable of sustaining at least twice the potential impact load of an employee's fall. Such certification must be made by a qualified person.⁷ When more than one employee is attached to an anchorage, these limits shall be multiplied by the number of employees attached.

(7) When "live" (activated) container gantry crane lifting beams or attached devices are used as anchorage points, the following requirements apply:

(i) The crane shall be placed into a "slow" speed mode;

(ii) The crane shall be equipped with a remote shut-off switch that can stop trolley, gantry, and hoist functions and that is in the control of the employee(s) attached to the beam; and

⁷For the purposes of this paragraph, qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation, and specifications in the subject work, project, or product.

(iii) A visible or audible indicator shall be present to alert the exposed employee(s) when the remote shut-off is operational.

(8) Fall protection system components, other than the anchorages, shall be certified as a unit of being capable of sustaining at least twice the potential impact load of an employee's fall. Such certification shall be made by a qualified person.⁸

(9) Each fall protection system shall incorporate the use of a full body harness.

(10) Each device, such as a safety cage, used to transport an employee(s) by being attached to a container gantry crane spreader, shall have a secondary means to prevent accidental disengagement and the secondary means shall be engaged.

(11) Each fall protection system shall be inspected before each day's use by a designated person. Any defective components shall be removed from service.

(12) Before using any fall protection system, the employee shall be trained in the use and application limits of the equipment, proper hookup, anchoring and tie-off techniques, methods of use, and proper methods of equipment inspection and storage.

(13) The employer shall establish and implement a procedure to retrieve personnel safely in case of a fall.

(i) *Working along unguarded edges.* The employer shall provide, and ensure that the employee uses, fall protection meeting the requirements of paragraph (k) of this section whenever the employee works along an unguarded edge where a fall hazard exists (see §1918.2).

⁸ Ibid.

§1918.86—Roll-on roll-off (Ro-Ro) operations (See also §1918.2, Ro-Ro operations, and §1918.25).

- (a) *Traffic control system.*** An organized system of vehicular and pedestrian traffic control shall be established and maintained at each entrance/exit ramp and on ramps within the vessel as traffic flow warrants.
- (b) *Ramp load limit.*** Each ramp shall be plainly marked with its load capacity. The marked capacity shall not be exceeded.
- (c) *Pedestrian traffic.*** Bow, stern, and side port ramps also used for pedestrian access shall meet the requirements of §1918.25. Such ramps shall provide a physical separation between pedestrian and vehicular routes. When the design of the ramp prevents physical separation, a positive means shall be established to prevent simultaneous use of the ramp by vehicles and pedestrians.
- (d) *Ramp maintenance.*** Ramps shall be properly maintained and secured.
- (e) *Hazardous routes.*** Before the start of Ro-Ro operations, the employer shall identify any hazardous routes or areas that could be mistaken for normal drive-on/drive-off routes. Such hazardous routes shall be clearly marked and barricaded.
- (f) *Air brake connections.*** Each tractor shall have all air lines connected when pulling trailers equipped with air brakes and shall have the brakes tested before commencing operations.
- (g) *Trailer load limits.*** After July 27, 1998, flat bed and low boy trailers shall be marked with their cargo capacities and shall not be overloaded.
- (h) *Cargo weights.*** Cargo to be handled via a Ro-Ro ramp shall be plainly marked with its weight in pounds (kilograms). Alternatively, the cargo stow plan or equivalent record containing the actual gross weight of the load may be used to determine the weight of the cargo.

(i) *Tractors*. Tractors used in Ro-Ro operations shall have:

(1) Sufficient power to ascend ramp inclines safely; and

(2) Sufficient braking capacity to descend ramp inclines safely.

(j) *Safe speeds*. Power driven vehicles used in Ro-Ro operations shall be operated at speeds that are safe for prevailing conditions.

(k) *Ventilation*. Internal combustion engine-driven vehicles shall be operated only where adequate ventilation exists or is provided. (Air contaminant requirements are found in §1918.94 and part 1910, subpart Z, of this chapter.)

(l) *Securing cargo*. Cargo loaded or discharged during Ro-Ro operations shall be secured to prevent sliding loads.

(m) *Authorized personnel*. Only authorized persons shall be permitted on any deck while loading or discharging operations are being conducted. Such authorized persons shall be equipped with high visibility vests (or equivalent protection¹⁰).

NOTE TO PARAGRAPH (m): High visibility vests or equivalent protection means high visibility/retro-reflective materials which are intended to make the user clearly visible by day through the use of high visibility (fluorescent) material and in the dark by vehicle headlights through the use of retro-reflective material. For example, an acceptable area of material for a vest or equivalent protection is .5m² (760 in.²) for fluorescent (background) material and .13m² (197 in.²) for retro-reflective material. Vests or equivalent protection, such as high visibility/retro- reflective coveralls, that are currently available for industrial use, may also be acceptable.

¹⁰Decals on hard hats will not be considered equivalent protection for the purposes of this paragraph.

(n) *Vehicle stowage positioning.* Drivers shall not drive vehicles, either forward or backward, while any personnel are in positions where they could be struck.

§1918.87—Ships' cargo elevators.

(a) *Safe working load.* The safe working loads of ship's cargo elevators shall be determined and followed.

(b) *Load distribution.* Loads shall be evenly distributed and maintained on the elevator's platform.

(c) *Elevator personnel restrictions.* Personnel shall not be permitted to ride on the elevator's platform if a fall hazard exists. (See §1918.2.)

(d) *Open deck barricades.* During elevator operation, each open deck that presents a fall hazard to employees shall be effectively barricaded.

§1918.88—Log operations.

(a) *Working in holds.* When loading logs into the holds of vessels and using dumper devices to roll logs into the wings, the employer shall ensure that employees remain clear of areas where logs being dumped could strike, roll up on, or pin them.

(b) *Personal flotation devices.* Each employee working on a log boom shall be protected by a personal flotation device meeting the requirements of §1918.105(b)(2).

(c) *Footwear.* The employer shall provide each employee that is working with logs appropriate footwear, such as spiked shoes or caulked sandals, and shall ensure that each employee wears appropriate footwear to climb or walk on logs.

(d) *Lifelines.* When employees are working on log booms or cribs, lifelines shall be furnished and hung overside to the water's edge.

(e) *Jacob's ladder.* When a log boom is being worked, a Jacob's ladder meeting the requirements of §1918.23 shall be provided for each gang working alongside unless other safe means of access (such as the vessel's gangway) is provided. However, no more than two Jacob's ladders are required for any single log boom being worked.

(f) *Life-ring.* When working a log boom alongside a ship, a U.S. Coast Guard approved 30-inch (76.2 cm) life-ring, with no less than 90 feet (27.4 m) of line, shall be provided either on the floating unit itself or aboard the ship close to each floating unit being worked.

(g) *Rescue boat.* When employees are working on rafts or booms, a rescue boat capable of effecting an immediate rescue shall be available. Powered rescue boats are required when the current exceeds one knot.

(h) *Log rafts.* When an employee is working logs out of the water, walking sticks¹¹ (safety sticks) shall be provided as follows:

(1) They shall be planked and be no less than 24 inches (0.61 m) wide;

(2) They shall extend along the entire length of all rafts on the side(s) of the vessel being worked, and to the means of access to the log raft(s); and

(3) They shall be buoyant enough to keep the walking surface above the waterline when employees are walking on them.

¹¹ A "walking stick" is two logs bolted or otherwise secured together with two or three planks firmly attached on top that serves as a floating walking and working surface and which is used in the loading of logs onto vessels from the water.

§1918.89—Handling hazardous cargo (See also §1918.2 and §1918.99).

Hazardous cargo shall be slung and secured so that neither the draft nor individual packages can fall because of tipping of the draft or slacking of the supporting gear.

Subpart I—General Working Conditions

§1918.90—Hazard Communication. (See also §1918.1(b)(4).)

See §1918.1(b)(4).

§1918.91—Housekeeping.

(a) General. Active work areas shall be kept free of equipment, such as lashing gear, and materials not in use, and clear of debris, projecting nails, strapping, and other objects not necessary to the work in progress.

(b) Slippery surfaces. The employer shall eliminate conditions causing slippery walking and working surfaces in immediate areas used by employees.

(c) Free movement of drafts. Dunnage shall not be placed at any location where it interferes with the free movement of drafts.

(d) Dunnage height. Dunnage racked against sweat battens or bulkheads shall not be used when the levels of such racks are above the safe reach of employees.

(e) Coaming clearance. Dunnage, hatch beams, tarpaulins or gear not in use shall be stowed no closer than three feet (0.91 m) to the port and starboard sides of the weather deck hatch coaming.

(f) Nails. (1) Nails that are protruding from shoring or fencing in the work area shall be rendered harmless.

(2) Dunnage, lumber, or shoring material in which there are visibly protruding nails shall be removed from the work area, or, if left in the area, the nails shall be rendered harmless.

(g) *Ice aloft.* Employees shall be protected from ice that may fall from aloft.

§1918.92—Illumination.

(a) *Walking, working, and climbing areas.* Walking, working, and climbing areas shall be illuminated. Unless conditions described in the regulations of the U.S. Coast Guard (33 CFR 154.570) exist for specific operations, illumination for cargo transfer operations shall be of a minimum light intensity of five foot-candles (54 lux). Where work tasks require more light to be performed safely, supplemental lighting shall be used.

(b) *Intensity measurement.* The lighting intensity shall be measured at the task/working surface, in the plane in which the task/working surface is present.

(c) *Arrangement of lights.* Lights shall be arranged so that they do not shine into the eyes of winch-drivers, crane operators, or hatch tenders. On Ro-Ro ships, stationary lights shall not shine directly into the eyes of drivers.

(d) *Portable lights.* Portable lights shall meet the following requirements:

(1) Portable lights shall be equipped with substantial reflectors and guards to prevent materials from coming into contact with the bulb.

(2) Flexible electric cords used with temporary lights shall be designed by the manufacturer for hard or extra-hard usage. Temporary and portable lights shall not be suspended by their electric cords unless the cords and lights are designed for this means of suspension. Connections and insulation shall be maintained in safe condition.

(3) Electric conductors and fixtures for portable lights shall be so arranged as to be free from contact with drafts, running gear, and other moving equipment.

(4) Portable cargo lights furnished by the employer for use aboard vessels shall be listed as approved for marine use by the U.S. Coast Guard or by a nationally recognized testing laboratory (see 1910.7).

(e) *Entry into darkened areas.* Employees shall not be permitted to enter dark holds, compartments, decks or other spaces without a flashlight or other portable light. The use of matches or open flames is prohibited.

§1918.93—Hazardous atmospheres and substances
(See also §1918.2).

(a) *Purpose and scope.* This section covers areas in which the employer knows, or has reason to believe, that a hazardous atmosphere or substance may exist, except where one or more of the following sections apply: §1918.94(a), Carbon monoxide; §1918.94(b), Fumigated grains; §1918.94(c), Fumigated tobacco; §1918.94(d), Other fumigated cargoes; §1918.94(e), Catch of menhaden and similar species of fish.

(b) *Determination of the hazard.* When the employer knows, or has reason to believe, that a space on a vessel contains or has contained a hazardous atmosphere, a designated and appropriately equipped person shall test the atmosphere prior to employee entry to detect whether a hazardous atmosphere exists.

(c) *Testing during ventilation.* When mechanical ventilation is used to maintain a safe atmosphere, tests shall be made by a designated person to ensure that the atmosphere is not hazardous.

(d) *Entry into hazardous atmospheres.* Only designated persons shall enter hazardous atmospheres, in which case the following provisions shall apply:

(1) Persons entering a space containing a hazardous atmosphere shall be protected by respiratory and emergency protective equipment meeting the requirements of subpart J of this part;

(2) Persons entering a space containing a hazardous atmosphere shall be instructed about the hazards, precautions to be taken, and the use of protective and emergency equipment. Standby observers, similarly equipped and instructed, shall continuously monitor the activity of employees within such space;

(3) Except in emergency or rescue operations, employees shall not enter any atmosphere identified as flammable or oxygen-deficient (less than 19.5% oxygen). Persons who may be required to enter flammable or oxygen-deficient atmospheres in emergency operations shall be instructed in the dangers attendant to those atmospheres and be instructed in the use of self-contained breathing apparatus which shall be used for entry.

(4) To prevent inadvertent employee entry into spaces identified as having hazardous, flammable, or oxygen-deficient atmospheres, appropriate warning signs or equivalent means shall be posted at all means of access to those spaces.

(e) *Asbestos cargo leak.* When the packaging of asbestos cargo leaks, spillage shall be cleaned up by designated employees protected from the harmful effects of asbestos as required by §1910.1001 of this chapter.

§1918.94—Ventilation and atmospheric conditions (See also §1918.2, definitions of Hazardous cargo, materials, substance, or atmosphere; and Ro-Ro operations).

(a) *Ventilation with respect to carbon monoxide.* (1) When internal combustion engines exhaust into a hold, intermediate deck, or any other compartment, the employer shall ensure that the atmosphere is tested as frequently as needed to prevent carbon monoxide (CO) concentrations from exceeding allowable limits. Such tests shall be made in the area in which employees are working by persons competent in the use of the test equipment and procedures. If operations are in a deep tank or refrigerated compartment, the first

test shall be made within one-half hour of the time the engine starts. To decide the need for further testing, the initial test in all other cargo handling areas shall be taken no later than one hour after the time the engine starts.

(i) The CO content of the atmosphere in a compartment, hold, or any enclosed space shall be maintained at not more than 50 parts per million (ppm) (0.005%) as an eight hour average area level and employees shall be removed from the enclosed space if the CO concentration exceeds a ceiling of 100 ppm (0.01%). Exception: The ceiling shall be 200 ppm (0.02%) instead of 100 ppm (0.01%) for Ro-Ro operations.

NOTE TO PARAGRAPH (a)(1)(i): The term eight hour average area level means that for any period in which the concentration exceeds 50 parts per million, the concentration shall be maintained for a corresponding period below 50 parts per million.

(ii) When both natural ventilation and the vessel's ventilation system are inadequate to keep the CO concentration within the allowable limits, the employer shall use supplementary means to bring such concentration within allowable limits, as determined by monitoring.

(2) The intakes of portable blowers and any exposed belt drives shall be guarded to prevent injury to employees.

(3) The frames of portable blowers shall be grounded at the source of the current by means of an equipment grounding conductor run with or enclosing the circuit conductors. When the vessel is the source of the current, the equipment grounding conductor shall be bonded to the structure of the vessel. Electric cords shall be free from visible defects.

(b) *Fumigated grains.* (1) Before commencing to handle bulk grain in any compartment of a vessel in which employees will or may be present, the employer shall:

(i) Determine whether the grain has been or will be fumigated at the elevator; and

(ii) Determine whether that compartment, or any cargo within it loaded at a prior berth, has been treated with a fumigant or any other chemical.

(2) If fumigant or chemical treatment has been carried out, or if there is reason to suspect that such treatment has been carried out, it shall be determined by atmospheric testing that the compartment's atmosphere is within allowable limits (See paragraph **(b)(3)** of this section).

(3) A test of the fumigant concentration in the atmosphere of the compartment shall be made after loading begins and before employees enter the compartment. Additional tests shall be made as often as necessary to ensure that hazardous concentrations do not develop.

(i) Tests for fumigant concentration shall be conducted by a designated person, who shall be thoroughly familiar with the characteristics of the fumigant being used, the correct procedure for measurement, the proper measuring equipment to be used, the fumigant manufacturers' recommendations and warnings, and the proper use of personal protective equipment to guard against the specific hazard.

(ii) If the concentration in any compartment reaches the level specified as hazardous by the fumigant manufacturer, or exceeds the permissible exposure limits of part 1910, subpart Z of this chapter, whichever is lower, all employees shall be removed from such compartments and shall not be permitted to reenter until tests prove that the atmosphere is within allowable limits.

(iii) No employee shall be permitted to enter any compartment in which grain fumigation has been carried out, or any compartment immediately next to such a compartment, until it has been determined by testing that the atmosphere in the compartment to be entered is within allowable limits for entry.

(iv) In the event a compartment containing a hazardous or unknown concentration of fumigants must be entered for testing of the atmosphere, or for emergency purposes, each employee

entering shall be protected by respiratory protective equipment following the provisions of §1918.102, and by any protective clothing and other personal protective equipment recommended by the fumigant manufacturer for protection against the particular hazard. At least two other employees shall be stationed outside the compartment as observers, to provide rescue services in case of emergency. The observers shall be equipped with similar personal protective equipment.

(v) One or more employees on duty shall be equipped and trained to provide any specific emergency medical treatment stipulated for the particular fumigant.

(vi) Emergency equipment required by this paragraph shall be readily accessible wherever fumigated grains are being handled.

(4) If a compartment is treated for local infestation before loading grain by a chemical other than a fumigant, the employee applying the treatment, and any other employees entering the compartment, shall be provided with and required to use any personal protective equipment recommended by the manufacturer of the product to protect them against the effects of exposure.

(c) *Fumigated tobacco.* The employer shall not load break-bulk tobacco until the carrier has provided written notification about whether or not the cargo has been fumigated. If break-bulk tobacco cargo has been treated with any toxic fumigant, loading shall not commence until a written warranty has been received from the fumigation facility that the aeration of the cargo has been such as to reduce the concentration of the fumigant to within the level specified as hazardous by the fumigant manufacturer, or does not exceed the permissible exposure limits of part 1910, subpart Z of this chapter, whichever is lower. Such notification and warranty shall be maintained for at least 30 days after the loading of the tobacco has been completed, and shall be available for inspection.

(d) *Other fumigated cargoes.* Before commencing to load or discharge fumigated cargo other than the cargo specifically addressed in paragraphs (b) and (c) of this section, the employer shall determine that the concentration of fumigants is within the

level specified as hazardous by the fumigant manufacturer, or does not exceed the permissible exposure limits of part 1910, subpart Z of this chapter, whichever is lower.

(e) Grain dust. When employees are exposed to concentrations of grain dust greater than the allowable limit found in subpart Z of part 1910 of this chapter, they shall be protected by suitable respiratory protective equipment as required by §1918.102.

(f) Catch of menhaden and similar species of fish. (1) The provisions of this paragraph shall not apply to vessels having and utilizing refrigerated holds for the carriage of all cargo.

(2) After a vessel has arrived at berth for discharge of menhaden, but before personnel enter the hold, and as frequently thereafter as tests show to be necessary, tests shall be made of the atmosphere in the vessel's hold to ensure a safe work space. The tests shall be done for the presence of hydrogen sulfide and for oxygen deficiency.

(3) Tests required by paragraph **(f)(2)** of this section shall be made by designated supervisory personnel, trained and competent in the nature of hazards and the use of test equipment and procedures.

(4) Before employees enter a hold it shall be tested for hydrogen sulfide and oxygen deficiency. Employees shall not enter the hold when the hydrogen sulfide level exceeds a 20 ppm ceiling or when the oxygen content is less than 19.5 percent, except in emergencies.

§1918.95—Sanitation.

(a) Washing and toilet facilities. (1) Accessible washing and toilet facilities sufficient for the sanitary requirements of employees shall be readily accessible at the worksite. The facilities shall have:

(i) Running water, including hot and cold or tepid water, at a minimum of one accessible location (when longshoring operations are conducted at locations without permanent facilities, potable water may be provided instead of running water);

(ii) Soap;

(iii) Individual hand towels, clean individual sections of continuous toweling, or warm air blowers; and

(iv) Fixed or portable toilets in separate compartments with latch-equipped doors. Separate toilet facilities shall be provided for male and female employees unless toilet rooms will be occupied by only one person at a time.

(2) Washing and toilet facilities shall be regularly cleaned and maintained in good order.

(b) *Drinking water.* (1) Potable drinking water shall be accessible to employees at all times.

(2) Potable drinking water containers shall be clean, containing only water and ice, and shall be fitted with covers.

(3) Common drinking cups are prohibited.

(c) *Prohibited eating areas.* Consumption of food or beverages in areas where hazardous materials are stowed or being handled is prohibited.

(d) *Garbage and overboard discharges.* Work shall not be conducted close to uncovered garbage or in the way of overboard discharges from the vessel's sanitary lines unless employees are protected from the garbage or discharge by a baffle or splash boards.

§1918.96—Maintenance and repair work in the vicinity of longshoring operations.

(a) *Noise interference* (See also §1918.1(b)(6)). Longshoring operations shall not be carried on when noise interferes with communications of warnings or instructions.

(b) *Falling objects.* Longshoring operations shall not be carried on in the hold or on deck beneath work being conducted overhead

whenever such work exposes the employee to a hazard of falling objects.

(c) *Hot work.* Longshoring operations shall not be carried on where the employee is exposed to damaging light rays, hot metal, or sparks from welding or cutting.

(d) *Abrasive blasting and spray painting.* Longshoring operations shall not be carried on in the immediate vicinity of abrasive blasting or spray painting operations.

(e) *Machine guarding.* (See also §1918.2, definition of “Danger zone”). (1) Danger zones on machines and equipment used by employees shall be guarded.

(2) The power supply to machines shall be turned off, locked out, and tagged out during repair, adjustment, or servicing.

§1918.97—First aid and lifesaving facilities (See Appendix V of this part).

(a) *Injury reporting.* The employer shall require each employee to report every work-related injury, regardless of severity, to the employer.

(b) *First-aid.* A first-aid kit shall be available at or near each vessel being worked. At least one person holding a valid first-aid certificate, such as is issued by the Red Cross or other equivalent organization, shall be available to render first-aid when work is in progress.

(c) *First-aid kits.* First-aid kits shall be weatherproof and shall contain individual sealed packages for each item that must be kept sterile. The contents of each kit shall be determined by a person certified in first-aid and cognizant of the hazards found in marine cargo handling operations. The contents shall be checked at intervals that allow prompt replacement of expended items.

(d) *Stretchers.* (1) For each vessel being worked, at least one Stokes basket stretcher, or its equivalent, shall be available to be

permanently equipped with bridles for attachment to the hoisting gear.

(2) Stretchers shall be kept close to vessels and shall be positioned to avoid damage to the stretcher.

(3) A blanket or other suitable covering shall be available.

(4) Stretchers shall have at least four sets of effective patient restraints in operable condition.

(5) Lifting bridles shall be of adequate strength, capable of lifting 1,000 pounds (454 kg) with a safety factor of five (lifting capability of 5,000 pounds, 2,270 kg), and shall be maintained in operable condition. Lifting bridles shall be provided for making vertical patient lifts at container berths. Stretchers for vertical lifts shall have foot plates.

(6) Stretchers shall be maintained in operable condition. Struts and braces shall be inspected for damage. Wire mesh shall be secured and have no burrs. Damaged stretchers shall not be used until repaired.

(7) Stretchers in permanent locations shall be mounted to prevent damage and be protected from the elements if located out-of-doors. If concealed from view, enclosures shall be marked to indicate the location of the lifesaving equipment.

(e) *Life-rings.* (1) The employer shall ensure that there is in the vicinity of each vessel being worked at least one U.S. Coast Guard approved 30-inch (76.2 cm) life-ring with no less than 90 feet (27.43 m) of line attached, and at least one portable or permanent ladder that will reach from the top of the apron to the surface of the water.

(2) In addition, when working a barge, scow, raft, lighter, log boom, or carfloat alongside a ship, a U.S. Coast Guard approved 30-inch (76.2 cm) life-ring, with no less than 90 feet (27.43 m) of line shall be provided either on the floating unit itself or aboard the ship in the immediate vicinity of each floating unit being worked.

(f) *Communication.* Telephone or equivalent means of communication shall be readily available at the worksite.

§1918.98—Qualifications of machinery operators and supervisory training.

(a) *Qualification of machinery operators.* (1) Only an employee determined by the employer to be competent by reason of training or experience, and who understands the signs, notices, and operating instructions and is familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power-operated cargo handling apparatus, or any power-operated vehicle, or give signals to the operator of any hoisting apparatus. However, an employee being trained and supervised by a designated person may operate such machinery and give signals to operators during training.

(2) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments that may suddenly incapacitate the employee, shall be permitted to operate a crane, winch or other power-operated cargo handling apparatus or a power-operated vehicle.

NOTE TO PARAGRAPH (a)(2): OSHA is defining suddenly incapacitating medical ailments consistent with the *Americans with Disabilities Act* (ADA), 42 U.S.C. 12101 (1990). Therefore, employers who act in accordance with the employment provisions (Title I) of the ADA (42 U.S.C. 12111-12117), the regulations implementing Title I (29 CFR part 1630), and the Technical Assistance Manual for Title I issued by the Equal Employment Opportunity Commission (Publication number: EEOC-M1A), will be considered as being in compliance with this paragraph.

(b) *Supervisory accident prevention proficiency.* (1) By July 16, 1999, each immediate supervisor of a cargo handling operation of more than five persons shall satisfactorily complete a course in accident prevention.

(2) Each employee newly assigned to supervisory duties after that date shall be required to meet the provisions of this paragraph within 90 days of such assignment.

(3) The accident prevention course shall consist of instruction suited to the particular operations involved.¹³

§1918.99—Retention of DOT markings, placards, and labels.

(a) Any employer who receives a package of hazardous material that is required to be marked, labeled or placarded in accordance with the U.S. Department of Transportation's Hazardous Materials Regulations (49 CFR parts 171 through 180) shall retain those markings, labels and placards on the package until the packaging is sufficiently cleaned of residues and purged of vapors to remove any potential hazards.

(b) Any employer who receives a freight container, rail freight car, motor vehicle, or transport vehicle that is required to be marked or placarded in accordance with the Hazardous Materials Regulations shall retain those markings and placards on the freight container, rail freight car, motor vehicle, or transport vehicle until the hazardous materials that require the marking or placarding are sufficiently removed to prevent any potential hazards.

(c) Markings, placards and labels shall be maintained in a manner that ensures that they are readily visible.

(d) For non-bulk packages that will not be reshipped, the provisions of the section are met if a label or other acceptable marking is affixed in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200).

¹³ The following are recommended topics: Safety responsibility and authority; elements of accident prevention; attitudes, leadership, and motivation; hazards of longshoring, including peculiar local circumstances; hazard identification and elimination; applicable regulations; and accident investigations.

(e) For the purposes of this section, the term “hazardous material” has the same definition as in the Hazardous Materials Regulations (49 CFR parts 171 through 180).

§1918.100—Emergency action plans.

(a) *Scope and application.* This section requires all employers to develop and implement an emergency action plan.¹⁴ The emergency action plan shall be in writing (except as provided in the last sentence of paragraph (e)(3) of this section) and shall cover those designated actions employers and employees must take to ensure employee safety from fire and other emergencies.

(b) *Elements.* The following elements, at a minimum, shall be included in the plan:

- (1) Emergency escape procedures and emergency escape route assignments;
- (2) Procedures to be followed by employees who remain to operate critical operations before they evacuate;
- (3) Procedures to account for all employees after emergency evacuation has been completed;
- (4) Rescue and medical duties for those employees who are to perform them;
- (5) The preferred means of reporting fires and other emergencies; and
- (6) Names or regular job titles of persons or departments that can be contacted for further information or explanation of duties under the plan.

¹⁴ When an employer directs his employees to respond to an emergency that is beyond the scope of the Emergency Action Plan, a plan developed in accordance with this § 1910.120(q) of this chapter shall apply.

(c) *Alarm system.* The employer shall establish an employee alarm system that provides warning for necessary emergency action or for reaction time for safe escape of employees from the workplace or the immediate work area, or both.

(d) *Evacuation.* The employer shall establish the types of evacuation to be used in emergency circumstances.

(e) *Training.* (1) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(2) The employer shall review the plan with each employee covered by the plan at the following times:

(i) Initially when the plan is developed;

(ii) Whenever the employee's responsibilities or designated actions under the plan change; and

(iii) Whenever the plan is changed.

(3) The employer shall review with each employee upon initial assignment those parts of the plan that the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and be available for employee review. Employers with 10 or fewer employees may communicate the plan orally to employees and need not maintain a written plan.

Subpart J—Personal Protective Equipment

§1918.101—Eye and face protection.

(a) The employer shall ensure that:

(1) Each affected employee uses appropriate eye and/or face protection where there are exposures to eye and/or face hazards. Such equipment shall comply with American National Standards Institute, ANSI Z-87.1-1989, *Practices for Occupational and*

Educational Eye and Face Protection.

(2) For an employee wearing corrective glasses, eye protection equipment required by paragraph (a)(1) of this section shall be of the type that can be worn over glasses. Prescription-ground safety lenses may be substituted if they provide equivalent protection.

(b) Eye protection shall be maintained in good condition.

(c) Used eye protection shall be cleaned and disinfected before issuance to another employee.

§1918.102—Respiratory protection (See §1918.1(b)(8)).

§1918.103—Head protection.

(a) The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects.

(b) Such equipment shall comply with American National Standards Institute, ANSI Z-89.1-1986, *Personnel Protection-Protective Headwear for Industrial Workers—Requirements*.

(c) Previously worn protective hats shall be cleaned and disinfected before issuance by the employer to another employee.

§1918.104—Foot protection.

(a) The employer shall ensure that each affected employee wears protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole.

(b) Such equipment shall comply with American National Standards Institute, ANSI Z-41-1991, *American National Standard for Personal Protection-Protective Footwear*.

§1918.105—Other protective measures.

(a) *Protective clothing.* (1) The employer shall provide and shall require the wearing of special protective clothing for each employee engaged in work where protective clothing is necessary.

(2) When necessary, protective clothing shall be cleaned and disinfected before reissue.

(b) *Personal flotation devices (PFDs).* (1) The employer shall provide and shall require the wearing of PFDs for each employee engaged in work in which the employee might fall into the water.

(2) PFDs (life preservers, life jackets or work vests) worn by each affected employee must be any United States Coast Guard (USCG) approved pursuant to 46 CFR part 160 (Type I, II, III, or V PFD) and marked for use as a work vest, for commercial use, or for use on vessels.

(3) Personal flotation devices shall be maintained in safe condition and shall be considered unserviceable when damaged in a manner that affects buoyancy or fastening capability.

Appendix I to Part 1918—Cargo Gear Register and Certificates (Non-mandatory)

Note: This appendix is non-mandatory and provides guidance to part 1918 to assist employers and employees in complying with the requirements of this standard, as well as to provide other helpful information. Nothing in this appendix adds or detracts from any of the requirements of this standard. The language in this appendix is taken directly from the recommended ILO document.

Form No. 1

Identity of National Authority or Competent Organization

Register of Ships' Lifting Appliances and Cargo Handling Gear

Name of Ship _____

Official Number _____

Call Sign _____

Port of Registry _____

Name of Owner _____

Register Number _____

Date of Issue _____

Issued by _____

Signature and Stamp _____

Note: This register is the standard international form as recommended by the International Labour Office in accordance with the ILO Convention No. 152.

General

The tests, examinations and inspections indicated in this register are based on the requirements of ILO Convention 152 and Recommendation 160. They are intended to ensure that ships having lifting appliances are initially certified by a competent person, and to establish periodically that they continue to be in safe working order to the satisfaction of a competent person acceptable to a competent authority. A Register of lifting appliances and items of loose gear shall be kept in a form prescribed by the competent authority, account being taken of this model recommended by the International Labour Office. This Register and related certificates shall be kept available to any person authorized by the competent authority. The Register and certificates for gear currently aboard the ship shall be preserved for at least five years after the date of the last entry.

Instruction

1. Initial Examination and Certification

1.1. Every lifting appliance shall be certified by a competent person before being taken into use for the first time to ensure that it is of good design and construction and of adequate strength for the purpose for which it is intended.

1.2. Before being taken into use for the first time, a competent person shall supervise and witness testing, and shall thoroughly examine every lifting appliance.

1.3. Every item of loose gear shall, before being taken into use for the first time, shall be tested, thoroughly examined and certified by a competent person, in accordance with national law or regulations.

1.4. Upon satisfactory completion of the procedures indicated above, the competent person shall complete and issue the Register of lifting appliances and attach the appropriate certificates. An entry shall be made in part I of the Register.

1.5. A rigging plan showing the arrangement of lifting appliances shall be provided. In the case of derricks and derrick cranes, the rigging should show at least the following information:

- (a) The position of guys;
- (b) The resultant force on blocks, guys, wire ropes and booms;
- (c) The position of blocks;
- (d) The identification mark of individual items; and
- (e) Arrangements and working range of union purchase.

2. Periodic Examination and Re-testing

2.1. All lifting appliances and every item of loose gear shall be thoroughly examined by a competent person at least once in every twelve months. The particulars of these thorough examinations shall be entered in part I of the Register.

2.2. Re-testing and thorough examination of all lifting appliances and every item of loose gear is to be carried out:

- (a) after any substantial alteration or renewal, or after repair to any stress bearing part, and
- (b) in the case of lifting appliances, at least once in every five years.

2.3. The retesting referred to in paragraph 2.2(a) may be omitted provided the part which has been renewed or repaired is subjected by separate test, to the same stress as would be imposed on it if it had been tested in-situ during the testing of the lifting appliance.

2.4. The thorough examinations and tests referred to in paragraph 2.2. are to be entered in part I of the Register.

2.5. No new item of loose gear shall be manufactured of wrought iron. Heat treatment of any existing wrought iron components should be carried out to the satisfaction of the competent person. No heat treatment should be applied to any item of loose gear unless the treatment is in accordance with the manufacturer's instruction; and to the satisfaction of the competent person. Any heat treatment and the associated examination are to be recorded by the competent person in part I of the Register.

3. *Inspections*

3.1. Regular visual inspections of every item of loose gear shall be carried out by a responsible person before use. A record of these regular inspections is to be entered in part II of the Register, but entries need only be made when the inspection has indicated a defect in the item.

4. *Certificates*

4.1. The certification forms to be used in conjunction with this Register (Form No. 1) are as follows:

(Form No. 2)—Certificate of test and thorough examination of lifting appliance.

(Form No. 2(U))—Certificate of test and thorough examination of derricks used in union purchase.

(Form No. 3)—Certificate of test and thorough examination of loose gear.

(Form No. 4)—Certificate of test and thorough examination of wire rope.

Definitions

(a) The term “competent authority” means a minister, government department, or other authority empowered to issue regulations, orders or other instructions having the force of law.

(b) The term “competent person” means a person appointed by the master of the ship or the owner of the gear to be responsible for the performance of inspections and who has sufficient knowledge and experience to undertake such inspections.

(c) The term “thorough examination” means a detailed visual examination by a competent person, supplemented if necessary by other suitable means or measures in order to arrive at a reliable conclusion as to the safety of the lifting appliance or item of loose gear examined.

(d) The term “lifting appliance” covers all stationary or mobile cargo handling appliances used on board ship for suspending,

raising or lowering loads or moving them from one position to another while suspended or supported.

(e) The term “loose gear” covers any gear by means of which a load can be attached to a lifting appliance, but which does not form an integral part of the appliance or load.

The Following Are Sample Forms of Certificates as Recommended by the ILO

[Part I—Thorough Examination of Lifting Appliances and Loose Gear]

<p>Situation and description of lifting appliances and loose gear (with distinguishing numbers or marks, if any) which have been thoroughly examined. (See note 1)</p> <p>(1)</p>	<p>Certificate Nos.</p> <p>(2)</p>	<p>Examination performed (See note 2)</p> <p>(3)</p>	<p>I certify that on the date to which I have appended my signature, the gear shown in col. (1) was thoroughly examined and no defects affecting its safe working condition were found other than those shown in col. (5) (date and signature)</p> <p>(4)</p>	<p>Remarks (to be dated and signed)</p> <p>(5)</p>
	<p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p>	

Note 1: If all the lifting appliances are thoroughly examined on the same date it will be sufficient to enter in Col. (1) "All lifting appliances and loose gear". If not, the parts that have been thoroughly examined on the dates stated must be clearly indicated.

Note 2: The thorough examinations to be indicated in Col. (3) include:

- (a) Initial.
- (b) 12 monthly.
- (c) 5 yearly.
- (d) Repair/Damage.
- (e) Other thorough examinations.

[Part II—Regular Inspections of Loose Gear]

Situation and description of loose gear (with distinguishing numbers or marks, if any) that has been inspected. (See note 1)	Signature and date of the responsible person carrying out the inspection	Remarks (to be dated and signed)

Note 1: All loose gear should be inspected before use. However, entries need only be made when the inspection discloses a defect.

Form No. 2

Identity of National Authority or Competent Organization

Certificate of Test and Thorough Examination of Lifting Appliances

Name of Ship _____

Official Number _____

Call Sign _____

Port of Registry _____

Name of Owner _____

Certificate No. _____

Situation and description of lifting appliances (with distinguishing numbers or marks, if any) which have been tested and thoroughly examined (1)	Angle to the horizontal or radius at which test load applied (2)	Test load (tonnes) (3)	Safe working load at angle or radius shown in col. 2 (tonnes) (4)

Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that on the date to which I have appended my signature, the gear shown in Col. (1) was tested and thoroughly examined and no defects or permanent deformation was found and that the safe working load is as shown.

Date: _____

Place: _____

Signature: _____

Note: This certificate is the standard international form as recommended by the International Labor Office in accordance with ILO Convention No. 152.

Reverse of Form No. 2

Instructions

1. Every lifting appliance shall be tested with a test load which shall exceed the Safe Working Load (SWL) as follows:

SWL	Test load
Up to 20 tonnes.....	25 percent in excess.
20 to 50 tonnes.....	5 tonnes in excess.
Over 50 tonnes.....	10 percent in excess.

2. In the case of derrick systems, the test load shall be lifted with the ship's normal tackle with the derrick at the minimum angle to the horizontal for which the derrick system was designed (generally 15 degrees), or at such greater angle as may be agreed. The angle at which the test was made should be stated in the certificate.

2.1. The SWL shown is applicable to swinging derrick systems only. When derricks are used in union purchase, the SWL (U) is to be shown on Form 2 (U).

2.2 In the case of heavy derricks, care should be taken to ensure that the appropriate stays are correctly rigged.

3. In the case of cranes, the test load is to be hoisted and luffed at slow speed. Gantry and traveling cranes together with their trolleys, where appropriate, are to be traversed and traveled over the full length of their track.

3.1. In the case of variable load-radius cranes, the tests are generally to be carried out with the appropriate test load at maximum, minimum and intermediate radii.

3.2. In the case of hydraulic cranes where limitations of pressure make it impossible to lift a test load 25 percent in excess of the safe working load, it will be sufficient to lift the greatest possible load, but in general this should not be less than 10 percent in excess of the safe working load.

4. As a general rule, tests should be carried out using test loads, and no exception should be allowed in the case of initial tests. In the case of repairs/replacement or when the periodic examination calls for re-test, consideration may be given to the use of spring or hydraulic balances provided the SWL of the lifting appliance does not exceed 15 tonnes. Where a spring or hydraulic balance is used, it shall be calibrated and accurate to within #2 percent and the indicator should remain constant for five minutes.

4.1. If the test weights are not used, this is to be indicated in Col. (3).

5. The expression “tonne” shall mean a tonne of 1000 kg.

6. The terms “competent person”, “thorough examination”, and “lifting appliance” are defined in Form No. 1.

Note: For recommendations on test procedures reference may be made to the ILO document “Safety and Health in Dock Work”.

Form No. 2(U)

Identity of National Authority or Competent Organization

Certificate of Test and Thorough Examination of Derricks Used in Union Purchase

Name of Ship _____

Official Number _____

Call Sign _____

Port of Registry _____

Name of Owner _____

Certificate No. _____

Situation and description of derricks used in Union Purchase (with distinguishing numbers or marks) which have been tested and thoroughly examined	Max. height of triangle plate above hatch coaming (m) or max. angle between runners.	Test load (tonnes)	Safe working load, SWL when operating in union purchase (tonnes)
(1)	(2)	(3)	(4)

Position of outboard preventer guy attachments:

- (a) forward/aft * of mast—(m) and
- (b) from ship's centerline—(m)

Position of inboard preventer guy attachments:

- (a) forward/aft * of mast—(m) and
- (b) from ship's centerline—(m)

* Delete as appropriate.

Name and address of the firm or competent person who witnessed testing and carried out thorough examination

I certify that on the date to which I have appended my signature, the gear shown in Col. (1) was tested and thoroughly examined and no defects or permanent deformation was found and that the safe working load is as shown.

Date: _____

Signature: _____

Place: _____

Note: This certificate is the standard international form as recommended by the International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 2 (U)

Instructions

1. Before being taken into use, the derricks rigged in Union Purchase shall be tested with a test load which shall exceed the Safe Working Load (SWL (U)) as follows:

SWL	Test load
Up to 20 tonnes.....	25 percent in excess.
20 to 50 tonnes.....	5 tonnes in excess.
Over 50 tonnes.....	10 percent in excess.

2. Tests are to be carried out at the approved maximum height of the triangle plate above the hatch coaming or at the angle between the cargo runners and with the derrick booms in their working positions, to prove the strength of deck eye plates and the Union Purchase system. These heights or angles must not exceed the values shown on the rigging plan.

3. Tests should be carried out using test loads.

4. The expression “tonne” shall mean a tonne of 1000 kg.

5. The terms “competent person”, “thorough examination” and “lifting appliance” are defined in Form No. 1.

Note: For recommendations on test procedures, reference may be made to the ILO document “Safety and Health in Dock Work”.

Form 3

Identity of National Authority or Competent Organization

Certificate of Test and Thorough Examination of Loose Gear

Name of Ship _____

Official Number _____

Call Sign _____

Port of Registry _____

Name of Owner _____

Certificate No. _____

Distinguishing number or mark	Description of loose gear	Number tested	Date of test	Test load (tonnes)	Safe work load (SWL) (tonnes)

Name and address of makers or suppliers:

Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that the above items of loose gear were tested and thoroughly examined and no defects affecting their SWL were found.

Date: _____

Place: _____

Signature: _____

Note: This certificate is the standard international form as recommended by the International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 3

Instructions

1. Every item of loose gear is to be tested and thoroughly examined before being put into use for the first time and after any substantial alteration or repair to any part liable to affect its safety. The test loads to be applied shall be in accordance with the following table:

Item	Test load (tonnes)
Single sheave blocks (See Note 1)	4 x SWL
Multi sheave blocks (See Note 2):	
SWL < 25 tonnes	2 x SWL
25 tonnes < SWL ≤ 160 tonnes	(0.933 x SWL) + 27
SWL > 160 tonnes	1.1 x SWL
Chains, hooks, rings, shackles, swivels, etc.:	
SWL < 25 tonnes	2 x SWL
SWL > 25 tonnes	(1.22 x SWL) + 20
Lifting beams, spreaders, frames and similar devices:	
SWL ≤ 10 tonnes	2 x SWL
10 tonnes < SWL ≤ 160 tonnes	(1.04 x SWL) + 9.6
SWL > 160 tonnes	1.1 x SWL

Note: 1. The SWL for a single sheave block, including single sheave blocks with beckets, is to be taken as one-half of the resultant load on the head fitting.

2. The SWL of a multi-sheave block is to be taken as the resultant load on the head fitting.

3. This form may also be used for the certification of interchangeable components of lifting appliances.

4. The expression “ton” shall mean a ton of 1,000 kg.

5. The terms “competent person”, “thorough examination” and “loose gear” are defined in Form No. 1.

Note: For recommendations on test procedures reference may be made to the ILO document “Safety and Health in Dock Work”.

Form No. 4

Identity of National Authority or Competent Organization

Certificate of Test and Thorough Examination of Wire Rope

Name of Ship _____

Official Number _____

Call Sign _____

Port of Registry _____

Name of Owner _____

Certificate No. _____

Name and address of maker or supplier	
Nominal diameter of rope (mm) Number of strands Number of wires per strand Core Lay Quality of wire (N/mm ²) Date of test of sample Load at which sample broke (tonnes) Safe working load of rope (tonnes) Intended use	

Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that the above particulars are correct, and that the rope was tested and thoroughly examined and no defects affecting its SWL were found.

Date: _____

Place: _____

Signature: _____

Note: This certificate is the standard international form as recommended by the International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 4

Instructions

1. Wire rope shall be tested by sample, a piece being tested to destruction.
2. The test procedure should be in accordance with an International or recognized National standard.
3. The SWL of the rope is to be determined by dividing the load at which the sample broke, by a co-efficient of utilization, determined as follows:

Item	Coefficient
Wire rope forming part of a sling:	
SWL of the sling	5
SWL < 10 tonnes	10^5
10 tonnes < SWL ≤ 160 tonnes	$(8.85 \times \text{SWL}) + 1910$
SWL > 160 tonnes	3
Wire rope as integral part of a lifting appliance:	
SWL of lifting appliance	10^4
SWL ≤ 160 tonnes	$(8.85 \times \text{SWL}) + 1910$
SWL > 160 tonnes	3

These coefficients should be adopted unless other requirements are specified by a National Authority.

4. The expression “tonne” shall mean a tonne of 1000 kg.

5. The terms “competent person”, “thorough examination” and “lifting appliance” are defined in Form No. 1.

Note: For recommendations on test procedures reference may be made to the ILO document “Safety and Health in Dock Work”.

Appendix II to Part 1918—Tables for Selected Miscellaneous Auxiliary Gear (Mandatory)

Note: This appendix is mandatory and is to be used in the appropriate sections of part 1918 when certificates or the manufacturers' use recommendations are not available.

Table 1—Wire Rope Clips

Improved plow steel, rope (Inches (cm))	Minimum number of clips		Minimum spacing (Inches (cm))
	Drop forged	Other material	
1/2 or less (1.3)	3	4	3 (7.6)
5/8 (1.6)	3	4	3 3/4 (9.5)
3/4 (1.9)	4	5	4 1/2 (11.4)
7/8 (2.2)	4	5	5 1/4 (13.3)
1 (2.5)	5	6	6 (15.2)
1 1/8 (2.9)	6	6	6 3/4 (17.1)
1 1/4 (3.2)	6	7	7 1/2 (19.1)
1 3/8 (3.5)	7	7	8 1/4 (21.0)
1 1/2 (3.8)	7	8	9 (22.9)

Table 2. — Natural Fiber Rope and Rope Slings — Load Capacity in Pounds (lbs.) Safety Factor=5 — Eye and Eye Sling — Basket Hitch
[Angle of rope to horizontal — 90 deg. 60 deg. 45 deg. 30 deg.]

Rope diameter nominal inch	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
$\frac{1}{2}$	550	250	1,100	900	750	550
$\frac{9}{16}$	700	350	1,400	1,200	1,000	700
$\frac{5}{8}$	900	450	1,800	1,500	1,200	900
$\frac{3}{4}$	1,100	550	2,200	1,900	1,500	1,100
$\frac{13}{16}$	1,300	650	2,600	2,300	1,800	1,300
$\frac{7}{8}$	1,500	750	3,100	2,700	2,200	1,500
1	1,800	900	3,600	3,100	2,600	1,800
$1\frac{1}{16}$	2,100	1,100	4,200	3,600	3,000	2,100
$1\frac{1}{8}$	2,400	1,200	4,800	4,200	3,400	2,400
$1\frac{1}{4}$	2,700	1,400	5,400	4,700	3,800	2,700
$1\frac{5}{16}$	3,000	1,500	6,000	5,200	4,300	3,000
$1\frac{1}{2}$	3,700	1,850	7,400	6,400	5,200	3,700
$1\frac{5}{8}$	4,500	2,300	9,000	7,800	6,400	4,500
$1\frac{3}{4}$	5,300	2,700	10,500	9,200	7,500	5,300
2	6,200	3,100	12,500	10,500	8,800	6,200
$2\frac{1}{8}$	7,200	3,600	14,500	12,500	10,000	7,200
$2\frac{1}{4}$	8,200	4,100	16,500	14,000	11,500	8,200
$2\frac{1}{2}$	9,300	4,700	18,500	16,000	13,000	9,300
$2\frac{5}{8}$	10,500	5,200	21,000	18,000	14,500	10,500

Table 2. — continued

Rope diameter nominal inch	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
Endless Sling						
1/2	950	500	1,900	1,700	1,400	950
9/16	1,200	600	2,500	2,200	1,800	1,200
5/8	1,600	800	3,200	2,700	2,200	1,600
3/4	2,000	950	3,900	3,400	2,800	2,000
13/16	2,300	1,200	4,700	4,100	3,300	2,300
7/8	2,800	1,400	5,600	4,800	3,900	2,800
1	3,200	1,600	6,500	5,600	4,600	3,200
1 1/16	3,800	1,900	7,600	6,600	5,400	3,800
1 1/8	4,300	2,200	8,600	7,500	6,100	4,300
1 1/4	4,900	2,400	9,700	8,400	6,900	4,900
1 5/16	5,400	2,700	11,000	9,400	7,700	5,400
1 1/2	6,700	3,300	13,500	11,500	9,400	6,700
1 5/8	8,100	4,100	16,000	14,000	11,500	8,100
1 3/4	9,500	4,800	19,000	16,500	13,500	9,500
2	11,000	5,600	22,500	19,500	16,000	11,000
2 1/8	13,000	6,500	26,000	22,500	18,500	13,000
2 1/4	15,000	7,400	29,500	25,500	21,000	15,000
2 1/2	16,500	8,400	33,500	29,000	23,500	16,500
2 5/8	18,500	9,500	37,000	32,500	26,500	18,500

Table 3A

Polypropylene Rope and Rope Slings						
Load Capacity in Pounds (lbs.) Safety Factor = 6						
Eye & Eye Sling						
Basket Hitch						
Angle of rope to horizontal						
Rope diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
$\frac{1}{2}$	650	350	1,300	1,200	950	650
$\frac{9}{16}$	800	400	1,600	1,400	1,100	800
$\frac{5}{8}$	1,000	500	2,000	1,700	1,400	1,000
$\frac{3}{4}$	1,300	700	2,700	2,300	1,900	1,300
$\frac{13}{16}$	1,600	800	2,600	2,300	2,200	1,600
$\frac{7}{8}$	1,800	900	3,100	2,700	2,600	1,800
1	2,200	1,100	3,600	3,100	3,100	2,200
$1 \frac{1}{16}$	2,500	1,300	4,200	3,600	3,600	2,500
$1 \frac{1}{8}$	2,900	1,500	4,800	4,200	4,100	2,900
$1 \frac{1}{4}$	3,300	1,700	6,700	5,800	4,700	3,300
$1 \frac{5}{16}$	3,700	1,900	7,400	6,400	5,300	3,700
$1 \frac{1}{2}$	4,700	2,400	9,400	8,100	6,700	4,700
$1 \frac{5}{8}$	5,700	2,900	11,500	9,900	8,100	5,700
$1 \frac{3}{4}$	6,800	3,400	13,500	12,000	9,600	6,800
2	8,200	4,100	16,500	14,500	11,500	8,200
$2 \frac{1}{8}$	9,700	4,800	19,500	16,500	13,500	9,700
$2 \frac{1}{4}$	11,000	5,500	22,000	19,000	15,500	11,000
$2 \frac{1}{2}$	12,500	6,300	25,500	22,000	18,000	12,500
$2 \frac{5}{8}$	14,500	7,100	28,500	24,500	20,000	14,500

Table 3B

Polypropylene Rope and Rope Slings						
Load Capacity in Pounds (lbs.) Safety Factor = 6						
Endless Sling						
Basket Hitch						
Angle of rope to horizontal 90 deg. 60 deg. 45 deg. 30 deg.						
Rope diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
$\frac{1}{2}$	1,200	600	2,400	2,100	1,700	1,200
$\frac{9}{16}$	1,500	750	2,900	2,500	2,100	1,500
$\frac{5}{8}$	1,800	900	3,500	3,100	2,500	1,800
$\frac{3}{4}$	2,400	1,200	4,900	4,200	3,400	2,400
$\frac{13}{16}$	2,800	1,400	5,600	4,900	4,000	2,800
$\frac{7}{8}$	3,300	1,600	6,600	5,700	4,600	3,300
1	4,000	2,000	8,000	6,900	5,600	4,000
$1 \frac{1}{16}$	4,600	2,300	9,100	7,900	6,500	4,600
$1 \frac{1}{8}$	5,200	2,600	10,500	9,000	7,400	5,200
$1 \frac{1}{4}$	6,000	3,000	12,000	10,500	8,500	6,000
$1 \frac{5}{16}$	6,700	3,400	13,500	11,500	9,500	6,700
$1 \frac{1}{2}$	8,500	4,200	17,000	14,500	12,000	8,500
$1 \frac{5}{8}$	10,500	5,100	20,500	18,000	14,500	10,500
$1 \frac{3}{4}$	12,500	6,100	24,500	21,000	17,500	12,500
2	15,000	7,400	29,500	25,500	21,000	15,000
$2 \frac{1}{8}$	17,500	8,700	35,500	30,100	24,500	17,500
$2 \frac{1}{4}$	19,500	9,900	39,500	34,000	28,000	19,500
$2 \frac{1}{2}$	23,000	11,500	45,500	39,500	32,500	23,000
$2 \frac{5}{8}$	25,500	13,000	51,500	44,500	36,500	25,500

**Table 4A—Rated Load for Grade 80 Alloy Steel Chain Slings¹
(Chain per NACM)**

Chain size nominal		Single leg sling 90 deg. To horizontal loading		Rated load double leg sling horizontal angle (note 2)					
inch	mm	lb	kg	60 deg. Double at 60 deg.		45 deg. Double at 45 deg.		30 deg. Double at 30 deg.	
				lb	kg	lb	kg	lb	kg
1/4	7	3,500	1,570	6,100	2,700	4,900	2,200	3,500	1,590
3/8	10	7,100	3,200	12,300	5,500	10,000	4,500	7,100	3,200
1/2	13	12,000	5,400	20,800	9,400	17,000	7,600	12,000	5,400
5/8	16	18,100	8,200	31,300	14,200	25,600	11,600	18,100	8,200
3/4	20	28,300	12,800	49,000	22,300	40,000	18,200	28,300	12,900
7/8	22	34,200	15,500	59,200	27,200	48,400	22,200	34,200	15,700
1	26	47,700	21,600	82,600	37,900	67,400	31,000	47,700	21,900
1 1/4	32	72,300	32,800	125,200	56,800	102,200	46,400	72,300	32,800

Notes:

(1) Other grades of proof tested steel chain include Proof Coil (Grade 28), Hi-Test (grade 43 Chain, and Transport (grade 70) Chain. These grades are not recommended for overhead lifting and therefore are not covered by this standard.

(2) Rating of multi-leg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

Table 4B—Maximum Allowable Wear at any Point of Link

Nominal chain or coupling link size		Maximum allowable wear of cross-sectional diameter, in.
inch	mm	
1/4	7	0.037
3/8	10	0.052
1/2	13	0.060
5/8	16	0.084
3/4	20	0.105
7/8	22	0.116
1	26	0.137
1 1/4	32	0.169

Note: For other sizes, consult chain or sling manufacturer.

Table 5—Safe Working Loads for Shackles

[In tons of 2,000 pounds]

Material size		Pin diameter		Safe working load in 2,000 lb tons
Inches	(cm)	Inches	(cm)	
1/2	(1.3)	5/8	(1.6)	1.4
5/8	(1.6)	3/4	(1.9)	2.2
3/4	(1.9)	7/8	(2.2)	3.2
7/8	(2.2)	1	(2.5)	4.3
1	(2.5)	1 1/8	(2.9)	5.6
1 1/8	(2.9)	1 1/4	(3.2)	6.7
1 1/4	(3.2)	1 3/8	(3.5)	8.2
1 3/8	(3.5)	1 1/2	(3.8)	10.0
1 1/2	(3.8)	1 5/8	(4.1)	11.9
1 3/4	(4.4)	2	(5.1)	16.2
2	(5.1)	2 1/4	(5.7)	21.2

Wire Rope Table—Rate Loads for Single Leg Slings 6 x 19 or 6 x 37 Classification Improved Plow Steel Grade Rope With Fiber Core (FC)

[Rated loads [note 1], tons (2,000 lb)]

Rope diameter, inch	Vertical			Choker
	HT	MS	S	HT, MS&S
1/4	0.49	0.51	0.55	0.38
5/16	0.78	0.79	0.85	0.6
3/8	1.1	1.1	1.2	0.85
7/16	1.4	1.5	1.7	1.2
1/2	1.8	2.0	2.1	1.5
9/16	2.3	2.5	2.7	1.9
5/8	2.8	3.1	3.3	2.3
3/4	3.9	4.4	4.8	3.3
7/8	5.2	6.0	6.4	4.5
1	6.7	7.7	4.8	5.9
1 1/8	8.4	9.5	11	7.4
1 1/4	10	12	13	9.0
1 3/8	12	14	15	11
1 1/2	15	17	18	13
1 5/8	17	19	21	15
1 3/4	20	22	25	17
2	26	29	32	22

HT=Hand Tucked Splice.

For Hidden Tuck Splice (IWRC), use vales in HT (FC) columns.

MS=Mechanical Splice.

S=Poured Socket or Swaged Socket.

Note: (1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

Wire Rope Table—Rated Loads for Single Leg Slings 6 x 19 or 6 x 37 Classification Extra Improved Plow Steel Grade Rope With Independent Wire Rope Core (IWRC)

[Rated loads [note 1] , tons (2,000 lb)]

Vertical				Choker	Vertical Basket	
Rope diameter, inch	HT	MS	S	HT, MS&S	[Note (2)] HT	[Note (3)] MS&S
$\frac{1}{4}$	0.53	0.59	0.59	0.31	1.1	1.1
$\frac{5}{16}$	0.82	0.87	0.92	0.64	1.6	1.7
$\frac{3}{8}$	1.2	1.2	1.3	0.92	2.3	2.5
$\frac{7}{16}$	1.5	1.7	1.8	1.2	3.1	3.4
$\frac{1}{2}$	2.0	2.2	2.3	1.6	4.0	4.4
$\frac{9}{16}$	2.5	2.8	2.9	2.0	1.9	5.5
$\frac{5}{8}$	3.0	3.4	3.6	2.6	6.0	6.8
$\frac{3}{4}$	4.2	4.9	5.1	3.6	8.4	9.7
$\frac{7}{8}$	5.5	6.6	6.9	4.8	11	13
1	7.2	8.5	9.0	6.3	14	17
1 $\frac{1}{8}$	9.0	10	11	7.9	18	20
1 $\frac{1}{4}$	11	13	14	9.7	22	26
1 $\frac{3}{8}$	13	15	17	12	27	31
1 $\frac{1}{2}$	16	18	20	14	32	37
1 $\frac{5}{8}$	18	21	23	16	37	43
1 $\frac{3}{4}$	21	25	27	19	43	49
2	28	32	34	24	55	64

HT=Hand tucked Splice

For Hidden Tuck Splice (IWRC), use values in HT columns of Table 3.

MS=Mechanical Splice. S=Poored Socket or Swaged Socket.

Notes:

(1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

(2) These values only apply when the D/d ratio is 15 or greater.

(3) These values only apply when the D/d ratio is 25 or greater.

D=Diameter or curvature around which the body of the sling is bent. d=Diameter of rope.

Wire Rope Table-Rated Loads for Single Leg Slings 6 x 19 or 6 x 37 Classification Extra Improved Plow Steel Grade Rope With Independent Wire Rope Core (IWRC)

[Rated loads [note 1], tons (2,000 lb)]

Vertical			Choker	Vertical basket [note (2)]
Rope diameter	MS	S	MS&S	MS&S
$\frac{1}{4}$	0.65	0.68	0.48	1.3
$\frac{5}{16}$	1.0	1.1	.074	2.0
$\frac{3}{8}$	1.4	1.5	1.1	2.9
$\frac{7}{16}$	1.9	2.0	1.4	3.9
$\frac{1}{2}$	2.5	2.7	1.9	5.1
$\frac{9}{16}$	3.2	3.4	2.4	6.4
$\frac{5}{8}$	3.9	4.1	2.9	7.8
$\frac{3}{4}$	5.6	5.9	4.1	11
$\frac{7}{8}$	7.6	8.0	5.6	15
1	9.8	10	7.2	20
$1 \frac{1}{8}$	12	13	9.1	24
$1 \frac{1}{4}$	15	16	11	30
$1 \frac{3}{8}$	18	19	13	36
$1 \frac{1}{2}$	21	23	16	42
$1 \frac{5}{8}$	24	26	18	49
$1 \frac{3}{4}$	28	31	21	57
2	37	40	28	73

HT=Hand tucked Splice

For Hidden Tuck Splice (IWRC), use values in HT columns of Table 3.

MS=Mechanical Splice.

S=Poured Socket or Swaged Socket.

NOTE: (1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

(2) These values only apply when the D/d ratio is 25 or greater.

Appendix III to Part 1918—The Mechanics of Conventional Cargo Gear (Non-mandatory)

Note: This appendix is non-mandatory and provides an explanation of the mechanics in the correct spotting of cargo handling gear.

Although the most prevalent method of cargo handling is accomplished through the use of modern shoreside container gantry cranes, there are occasions when break-bulk cargo is handled with conventional ship's cargo gear. This appendix provides a reference for those unfamiliar with such cargo gear.

Sections 1918.52, 1918.53, and 1918.54 all address the subject of rigging and operating vessel's cargo handling gear. It is important to understand that under the Burton System of cargo handling (conventional gear consisting of two cargo derricks with married falls), the midships or up-and-down boom should be spotted as close to the fore and aft centerline of the hatch as operationally possible. Such spotting of the up-and-down boom will allow the most effective leads for the guy(s) and preventer(s) to safely support the lateral stresses generated in the boom(s) by the married falls. As the lead of the guy(s) and preventer(s) approaches the vertical, in supporting the boom(s) head, the total stress in the guy(s) increases rapidly due to the increased vertical force that is generated in the guy(s) in order to counteract any particular horizontal or lateral force exerted on the boom(s) head. The appreciable vertical forces that are generated in this process are transmitted, in substantial part, to the boom(s) and topping lift(s), causing proportionate compressive stresses in the boom(s) and tension stresses in the topping lift(s).

In general, guys and preventers must be located so that enough vertical resistance is developed so as to prohibit the boom(s) from jackknifing as cargo passes across the deck. Special care must be exercised in the proper placement of guys and preventers associ-

ated with the Burton or yard boom. Preventers, when used, must parallel as closely as possible the guys that they support. Guys and preventers must not be attached to the same fitting.

While under a load, the cargo falls (running rigging) must not be permitted to chafe on any standing or other running gear. Special attention must be paid to ensure that cargo runners work freely through the heel block, without chafing the cheek of the block.

Also, bobbing chains and heel block preventers must be attached so as to not interfere with the movement of the cargo runners.

Appendix IV to Part 1918—Special Cargo Gear and Container Spreader Test Requirements (Mandatory) [see §1918.61 (f), (g), (h)]

Type gear	Test requirement	Tested by	Proof test	
A. All Special Cargo Handling Gear Purchased or Manufactured on or After January 21, 1998				
1. Safe Working Load--greater than 5 short tons (10,000 lbs./4.5 metric tons).	Prior to initial use. Prior to reuse after structural damage repair. Every four years after initial proof load test.	OSHA accredited agency only. OSHA accredited agency or designated person.	Up to 20 short tons. From 20 to 50 short tons. Over 50 short tons.	125% SWL. 5 short tons in excess of SWL. 110% SWL.
2. Safe Working Load - 5 short tons or less.	Prior to initial use. Prior to reuse after structural damage repair.	OSHA accredited agency or designated person.	125% SWL.	
3. Inter-modal container spreaders not part of vessel's cargo handling gear.	Prior to initial use. Prior to reuse after structural damage repair. Every four years after initial proof load test.	OSHA accredited agency only. OSHA accredited agency or designated person.	125% SWL.	

B. All Special Cargo Handling Gear in Use Prior to January 21, 1998 and Proof Load Tested Prior to Initial Use (See Note Below)				
1. Safe Working Load--greater than 5 short tons (10,000 lbs./4540 kg.	Every four years starting on January 21, 1998.	OSHA accredited agency or designated person.	Up to 20 short tons.	125% SWL.
			From 20 to 50 short tons.	5 short tons in excess of SWL.
	Prior to reuse after structural damage repair.	OSHA accredited agency.	Over 50 short tons.	110% SWL.
2. Safe Working Load - 5 short tons or less.	Prior to reuse after structural damage repair.	OSHA accredited agency or designated person.	125% SWL.	
3. Intermodal container spreaders not part of vessel's cargo handling gear.	Every four years starting on January 21, 1998. Prior to reuse after structural damage repair.	OSHA accredited agency or designated person. OSHA accredited agency.	125% SWL.	

Note to Appendix IV: Special stevedoring gear in use prior to January 21, 1998 was covered by §1918.61(b), in effect prior to January 21, 1998. (See 29 CFR Parts 1911 to 1925 revised as of July 1, 1997). The assumption is made that gear in use prior to January 21, 1998, has already been proof load tested, although not necessarily by an accredited agency. However, if the employer cannot certify that such gear was proof load tested under §1918.61(b), in effect prior to January 21, 1998, (See 29 CFR Parts 1911 to 1925 revised as of July 1, 1997), then it must be proof load tested in accordance with §1918.61 in effect on January 21, 1998, (See 29 CFR Parts 1911 to 1925 revised as of July 1, 1998.)

Appendix V to Part 1918—Basic Elements of a First Aid Training Program (Non-mandatory)

Note: This appendix is non-mandatory and provides guidelines for small businesses, institutions teaching first aid, and the recipients of first aid training.

General Program Elements

A. Teaching Methods

1. Trainees should develop “hands on” skills through the use of manikins and trainee partners during their training.
2. Trainees should be exposed to acute injury and illness settings as well as the appropriate response to those settings through the use of visual aids, such as video tape and slides.
3. Training should include a course workbook which discusses first aid principles and responses to settings that require interventions.
4. Training duration should allow enough time for particular emphasis on situations likely to be encountered in particular workplaces.
5. An emphasis on quick response to first aid situations should be incorporated throughout the program.

B. Principles of Responding to a Health Emergency

The training program should include instruction in:

1. Injury and acute illness as a health problem.
2. Interactions with the local emergency medical services system. Trainees have the responsibility for maintaining a current list of emergency telephone numbers (police, fire, ambulance, poison control) easily accessible to all employees.
3. The principles of triage.
4. The legal aspects of providing first aid services.

C. Methods of Surveying the Scene and the Victim(s)

The training program should include instruction in:

1. The assessment of scenes that require first aid services including:

- a. general scene safety.
 - b. likely event sequence.
 - c. rapid estimate of the number of persons injured.
 - d. identification of others able to help at the scene.
2. Performing a primary survey of each victim including airway, breathing, and circulation assessments as well as the presence of any bleeding.
 3. The techniques and principles of taking a victim's history at the scene of an emergency.
 4. Performing a secondary survey of the victim including assessments of vital signs, skin appearance, head and neck, eye, chest, abdomen, back, extremities, and medical alert symbols.

D. Basic Adult Cardiopulmonary Resuscitation (CPR)

Basic adult CPR training should be included in the program. Retesting should occur every year. The training program should include instruction in:

1. Establishing and maintaining adult airway patency.
2. Performing adult breathing resuscitation.
3. Performing adult circulatory resuscitation.
4. Performing choking assessments and appropriate first aid interventions.
5. Resuscitating the drowning victim.

E. Basic First Aid Intervention

Trainees should receive instruction in the principles and performance of:

1. Bandaging of the head, chest, shoulder, arm, leg, wrist, elbow, foot, ankle, fingers, toes, and knee.
2. Splinting of the arm, elbow, clavicle, fingers, hand, forearm, ribs, hip, femur, lower leg, ankle, knee, foot, and toes.
3. Moving and rescuing victims including one and two person lifts, ankle and shoulder pulls, and the blanket pull.

F. Universal Precautions

Trainees should be provided with adequate instruction on the need for and use of universal precautions. This should include:

1. The meaning of universal precautions, which body fluids are considered potentially infectious, and which are regarded as hazardous.
2. The value of universal precautions for infectious diseases such as AIDS and hepatitis B.
3. A copy of OSHA's standard for occupational exposure to bloodborne pathogens or information on how to obtain a copy.
4. The necessity for keeping gloves and other protective equipment readily available and the appropriate use of them.
5. The appropriate tagging and disposal of any sharp item or instrument requiring special disposal measures such as blood soaked material.
6. The appropriate management of blood spills.

G. First Aid Supplies

The first aid provider should be responsible for the type, amount, and maintenance of first aid supplies needed for their particular worksite(s). These supplies need to be stored in a convenient area available for emergency access.

H. Trainee Assessments

Assessment of successful completion of the first aid training program should include instructor observation of acquired skills and written performance assessments. First aid skills and knowledge should be reviewed every three years.

I. Program Update

The training program should be periodically reviewed with current first aid techniques and knowledge. Outdated material should be replaced or removed.

Specific Program Elements

A. Type of Injury Training

1. Shock

Instruction in the principles and first aid intervention in:

- a. shock due to injury.
- b. shock due to allergic reactions.
- c. the appropriate assessment and first aid treatment of a victim who has fainted.

2. Bleeding

- a. the types of bleeding including arterial, venous, capillary, external, and internal.
- b. the principles and performance of bleeding control interventions including direct pressure, pressure points, elevation, and pressure bandaging.
- c. the assessment and approach to wounds including abrasions, incisions, lacerations, punctures, avulsions, amputations, and crush injuries.
- d. the principles of wound care including infection precautions, wounds requiring medical attention, and the need for tetanus prophylaxis.

3. Poisoning

Instruction in the principles and first aid intervention of:

- a. alkali, acid and systemic poisons. In addition, all trainees should know how and when to contact the local Poison Control Center.
- b. inhaled poisons including carbon monoxide, carbon dioxide, smoke, and chemical fumes, vapors and gases as well as the importance of assessing the toxic potential of the environment to the rescuer and the need for respirators.

Trainees should be instructed in the acute effect of chemicals utilized in their plants, the location of chemical inventories, material safety data sheets (MSDS's), chemical emergency information, and antidote supplies.

- c. topical poisons including poison ivy, poison sumac, poison oak, and insecticides.
- d. drugs of abuse including alcohol, narcotics such as heroin and cocaine, tranquilizers, and amphetamines.

4. Burns

Instruction in the principles and first aid intervention of:

- a. assessing the severity of the burn including first degree, second degree, and third degree burns.
- b. differentiating between the types of third degree burns (thermal, electrical, and chemical) and their specific interventions. Particular attention should be focused upon chemical burns, and the use of specific chemicals in the workplace which may cause them.

5. Temperature Extremes

Instruction in the principles and first aid intervention of:

- a. exposure to cold including frostbite and hypothermia.
- b. exposure to heat including heat cramps, heat exhaustion, and heat stroke.

6. Musculoskeletal Injuries

The training program should include instruction in the principles and first aid intervention in:

- a. open fractures, closed fractures, and splinting.
- b. dislocations, especially the methods of joint dislocations of the upper extremity. The importance of differentiating dislocations from fractures.
- c. joint sprains.
- d. muscle strains, contusions, and cramps.
- e. head, neck, back, and spinal injuries.

7. Bites and Stings

Instruction in the principles and first aid intervention in:

- a. human and animal (especially dog and snake) bites.
- b. bites and stings from insects (spiders, ticks, scorpions, hornets)

and wasps). Interventions should include responses to anaphylactic shock; other allergic manifestations; rabies and tetanus prophylaxis.

8. Medical Emergencies

Instruction in the principles and first aid intervention of:

- a. heart attacks
- b. strokes
- c. asthma attacks
- d. diabetic emergencies including diabetic coma, insulin shock, hyperglycemia, and hypoglycemia.
- e. seizures including tonic-clonic and absence seizures. Importance of not putting gags in mouth.
- f. pregnancy including the appropriate care of any abdominal injury or vaginal bleeding.

9. Confined Spaces

- a. the danger of entering a confined space to administer first aid without having the appropriate respiratory protection.
- b. if first aid personnel will be required to assist evacuations from confined spaces, additional training will be needed.

B. Site of Injury Training

Instruction in the principles and first aid intervention of injuries to the following sites:

1. Head and Neck

- a. including skull fractures, concussions, and mental status assessments with particular attention to temporary loss of consciousness and the need for referral to a physician.
- b. including the appropriate approach to the management of the individual who has suffered a potential neck injury or fracture.

2. Eye

- a. foreign bodies, corneal abrasions and lacerations.
- b. chemical burns and the importance of flushing out the eye.
- c. the importance of not applying antibiotics without physician supervision.

3. Nose

- a. nose injuries and nose bleeds.

4. Mouth and Teeth

- a. oral injuries, lip and tongue injuries, and broken and removed teeth. The importance of preventing inhalation of blood and teeth.

5. Chest

- a. rib fractures, flail chest, and penetrating wounds.

6. Abdomen

- a. blunt injuries, penetrating injuries, and protruding organs.

7. Hand, Finger, and Foot Injuries

- a. finger/toe nail hematoma, lacerations, splinters, finger nail avulsion, ring removal, and foreign bodies.
- b. the importance of identifying amputation care hospitals in the area. When an amputation occurs, appropriate handling of amputated fingers, hands, and feet during the immediate transportation of the victim and body part to the hospital.

Editorial Note: This listing is provided for informational purposes only. It is compiled and kept up-to-date by the Department of Labor.

What Other Help Does OSHA Provide?

State Programs

The *Occupational Safety and Health Act of 1970* encourages states to develop and operate their own job safety and health plans. OSHA approves and monitors these plans. There are currently 25 state plan states: 23 of these states administer plans covering both private and public (state and local government) employment; the other 2 states, Connecticut and New York, cover the public sector only.

The 25 states and territories with their own OSHA-approved occupational safety and health plans must adopt standards comparable to, or at least as effective as, the federal standards within 6 months of a federal standard's promulgation. Until such time as a state standard is promulgated, Federal OSHA provides interim enforcement assistance, as appropriate, in these states. A listing of states with approved plans appears at the end of this publication.

Consultation Services

Consultation assistance is available on request to employers who want help in establishing and maintaining a safe and healthful workplace. Largely funded by OSHA, the service is provided at no cost to the employer. Primarily developed for smaller employers with more hazardous operations, state government agencies or universities employing professional safety consultants and health consultants deliver the consultation service. Comprehensive assistance includes an appraisal of all mechanical, physical work practice, and environmental hazards of the workplace and all aspects of the employer's present job safety and health program. No penalties are proposed or citations issued for hazards identified by the consultants.

For more information concerning consultations, see the list of consultation projects at the end of this publication.

Voluntary Protection Programs

Voluntary Protection Programs (VPP) and onsite consultation services, when coupled with an effective enforcement program, expand worker protection to help meet the goals of the *OSH Act*. The three VPPs—Star, Merit, and Demonstration—are designed to recognize outstanding achievement by companies that have successfully incorporated comprehensive safety and health programs into their total management system. They motivate others to achieve excellent safety and health results in the same outstanding way, and they establish a cooperative relationship among employers, employees, and OSHA.

For additional information on VPP and how to apply, contact the OSHA offices listed at the end of this publication.

Training and Education

OSHA's area offices offer a variety of informational services, such as publications, audiovisual aids, technical advice, and speakers for special engagements. OSHA's Training Institute in Des Plaines, IL, provides basic and advanced courses in safety and health for federal and state compliance officers, state consultants, federal agency personnel, and private sector employers, employees, and their representatives.

OSHA also provides funds to nonprofit organizations, through grants, to conduct workplace training and education in subjects where OSHA believes there is a lack of workplace training. OSHA awards grants annually, and grant recipients contribute about 20 percent of the total grant cost.

For more information on grants, training, and education, contact the OSHA Training Institute, Office of Training and Education, 1555 Times Drive, Des Plaines, IL 60018, (847) 297-4810.

Electronic Information

Internet—OSHA standards, interpretations, directives, technical advisors, compliance assistance, and additional information are now on OSHA's website at <http://www.osha.gov>.

CD-ROM—A wide variety of OSHA materials, including standards, interpretations, directives, and more are available and can be purchased from the U.S. Government Printing Office. To order write to the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 or phone (202) 512-1800. Specify OSHA Regulations, Documents and Technical Information on CD-ROM (ORDT), GPO Order No. S/N 729-013-00000-5. The price is \$46 per year (\$57.50 foreign); \$17 per single copy (\$21.25 foreign).

Emergencies

To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office:

For further information on any OSHA program, contact your nearest OSHA area or regional office listed at the end of this publication.

States with Approved Plans

Commissioner

Alaska Department of Labor
and Workforce Development
P.O. Box 21149
1111 West 8th Street
Room 306
Juneau, AK 99802-1149
(907) 465-2700

Director

Industrial Commission of Arizona
800 W. Washington
Phoenix, AZ 85007-2922
(602) 542-5795

Director

California Department of Industrial
Relations
455 Golden Gate Avenue
10th Floor
San Francisco, CA 94102
(415) 703-5050

Commissioner

Connecticut Department of Labor
200 Folly Brook Boulevard
Wethersfield, CT 06109
(860) 566-5123

Director

Hawaii Department of Labor
and Industrial Relations
830 Punchbowl Street
Honolulu, HI 96831
(808) 586-8844

Commissioner

Indiana Department of Labor
State Office Building
402 West Washington Street
Room W195
Indianapolis, IN 46204-2751
(317) 232-2378

Commissioner

Iowa Division of Labor
1000 E. Grand Avenue
Des Moines, IA 50319-0209
(515) 281-3447

Secretary

Kentucky Labor Cabinet
1047 U.S. Highway, 127 South
Suite 4
Frankfort, KY 40601
(502) 564-3070

Commissioner

Maryland Division of Labor
and Industry
Department of Labor, Licensing,
and Regulation
1100 N. Eutaw Street, Room 613
Baltimore, MD 21201-2206
(410) 767-2215

Director

Michigan Department of Consumer
and Industry Services
P.O. Box 30643
Lansing, MI 48909-8143
(517) 322-1814

Commissioner

Minnesota Department of Labor
and Industry
443 Lafayette Road
St. Paul, MN 55155
(651) 296-2342

Director

Nevada Division of Industrial
Relations
400 West King Street, Suite 400
Carson City, NV 89703-0209
(702) 687-3032

Commissioner

New Jersey Department of Labor
John Fitch Plaza-Labor Building
Market & Warren Streets
P.O. Box 110
Trenton, NJ 08625-0110
(609) 292-2975

Secretary

New Mexico Environment Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850

Commissioner

New York Department of Labor
W. Averell Harriman State Office
Building - 12, Room 500
Albany, NY 12240
(518) 457-2746

Commissioner

North Carolina Department of Labor
4 West Edenton Street
Raleigh, NC 27601-1092
(919) 807-2900

Administrator

Department of Consumer
and Business Services
Occupational Safety and Health
Division (OR-OSHA)
350 Winter Street, NE, Room 430
Salem, OR 97310-0220
(503) 378-3272

Secretary

Puerto Rico Secretary of Labor
and Human Resources
Prudencio Rivera Martinez Building
505 Munoz Rivera Avenue
Hato Rey, PR 00918
(787) 754-2119

Director

South Carolina Department of Labor,
Licensing, and Regulation
Koger Office Park, Kingstree Building
110 Centerview Drive
P.O. Box 11329
Columbia, SC 29211
(803) 896-4300

Commissioner

Tennessee Department of Labor
710 James Robertson Parkway
Nashville, TN 37243-0659
(615) 741-2582

Commissioner

Labor Commission of Utah
160 East 300 South, 3rd Floor
P.O. Box 146650
Salt Lake City, UT 84114-6650
(801) 530-6898

Commissioner

Vermont Department of Labor
and Industry
National Life Building - Drawer 20
120 State Street
Montpelier, VT 05620-3401
(802) 828-2288

Commissioner

Virgin Islands Department of Labor
2203 Church Street
Christiansted
St. Croix, VI 00820-4660
(340) 773-1990

Commissioner

Virginia Department of Labor
and Industry
Powers-Taylor Building
13 South 13th Street
Richmond, VA 23219
(804) 786-2377

Director

Washington Department of Labor
and Industries
General Administration Bldg.
P.O. Box 44001
Olympia, WA 98504-4001
(360) 902-4200

Administrator

Workers' Safety and Compensation
Division (WSC)
Wyoming Department of Employment
Herschler Building, 2nd Floor East
122 West 25th Street
Cheyenne, WY 82002
(307) 777-7786

OSHA Consultation Project Directory

State	Telephone
Alabama	(205) 348-3033
Alaska	(907) 269-4957
Arizona	(602) 542-1695
Arkansas	(501) 682-4522
California	(916) 574-2555
Colorado	(970) 491-6151
Connecticut	(860) 566-4550
Delaware	(302) 761-8219
District of Columbia	(202) 576-6339
Florida	(813) 974-9962
Georgia	(404) 894-2643
Guam	011 (671) 475-0136
Hawaii	(808) 586-9100
Idaho	(208) 426-3283
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Indiana	(317) 232-2688
Iowa	(515) 281-7629
Kansas	(785) 296-7476
Kentucky	(502) 564-6895
Louisiana	(225) 342-9601
Maine	(207) 624-6460
Maryland	(410) 880-4970
Massachusetts	(617) 727-3982
Michigan	(517) 322-6823(H)
.....	(517) 322-1809(S)
Minnesota	(612) 297-2393
Mississippi	(601) 987-3981
Missouri	(573) 751-3403
Montana	(406) 444-6418
Nebraska	(402) 471-4717
Nevada	(702) 486-9140
New Hampshire	(603) 271-2024
New Jersey	(609) 292-3923
New Mexico	(505) 827-4230
New York	(518) 457-2238

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North Dakota	(701) 328-5188
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Oklahoma	(405) 528-1500
Oregon	(503) 378-3272
Pennsylvania	(724) 357-2396
Puerto Rico	(787) 754-2171
Rhode Island	(401) 222-2438
South Carolina	(803) 734-9614
South Dakota	(605) 688-4101
Tennessee	(615) 741-7036
Texas	(512) 804-4640
Utah	(801) 530-6901
Vermont	(802) 828-2765
Virginia	(804) 786-6359
Virgin Islands	(340) 772-1315
Washington	(360) 902-5638
West Virginia	(304) 558-7890
Wisconsin	(608) 266-8579(H)
.....	(262) 523-3040(S)
Wyoming	(307) 777-7786

(H) - Health

(S) - Safety

OSHA Area Offices

Area	Telephone
Albany, NY	(518) 464-4338
Albuquerque, NM	(505) 248-5302
Allentown, PA	(610) 776-0592
Anchorage, AK	(907) 271-5152
Appleton, WI	(920) 734-4521
Austin, TX	(512) 916-5783
Avenel, NJ	(732) 750-3270
Bangor, ME	(207) 941-8177
Baton Rouge, LA	(225) 389-0474
Bayside, NY	(718) 279-9060
Bellevue, WA	(206) 553-7520
Billings, MT	(406) 247-7494
Birmingham, AL	(205) 731-1534
Bismarck, ND	(701) 250-4521
Boise, ID	(208) 321-2960
Bowmansville, NY	(716) 684-3891
Braintree, MA	(617) 565-6924
Bridgeport, CT	(203) 579-5516
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Carson City, NV	(702) 885-6963
Charleston, WV	(304) 347-5937
Cincinnati, OH	(513) 841-4132
Cleveland, OH	(216) 522-3818
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Des Moines, IA	(515) 284-4794
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El Paso, TX	(915) 534-6251
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Fairview Heights, IL	(618) 632-8612
Fort Lauderdale, FL	(954) 424-0242
Fort Worth, TX	(817) 428-2470
Frankfort, KY	(502) 227-7024
Guaynabo, PR	(787) 277-1560
Harrisburg, PA	(717) 782-3902
Hartford, CT	(860) 240-3152
Hasbrouck Heights, NJ	(201) 288-1700
Honolulu, HI	(808) 541-2685
Houston, TX (South)	(281) 286-0583
Houston, TX (North)	(281) 591-2438
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Jacksonville, FL	(904) 232-2895
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Lansing, MI	(517) 327-0904
Linthicum, MD	(410) 865-2055
Little Rock, AR	(501) 324-6291
Lubbock, TX	(806) 472-7681
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Methuen, MA	(617) 565-8110
Milwaukee, WI	(414) 297-3315
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New York, NY	(212) 466-2482
Norfolk, VA	(757) 441-3820
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Omaha, NE	(402) 221-3182
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Philadelphia, PA	(215) 597-4955
Phoenix, AZ	(602) 640-2007
Pittsburgh, PA	(412) 395-4903
Portland, ME	(207) 780-3178
Portland, OR	(503) 326-2251
Providence, RI	(401) 528-4669

Raleigh, NC	(919) 856-4770
Sacramento, CA	(916) 566-7470
Salt Lake City, UT	(801) 487-0680
San Diego, CA	(619) 557-2909
Savannah, GA	(912) 652-4393
Smyrna, GA	(770) 984-8700
Springfield, MA	(413) 785-0123
St. Louis, MO	(314) 425-4249
Syracuse, NY	(315) 451-0808
Tampa, FL	(813) 626-1177
Tarrytown, NY	(914) 524-7510
Toledo, OH	(419) 259-7542
Tucker, GA	(770) 493-6644
Westbury, NY	(516) 334-3344
Wichita, KS	(316) 269-6644
Wilkes-Barre, PA	(570) 826-6538
Wilmington, DE	(302) 573-6518

Regional Offices

Region I

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JFK Federal Building

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Region II

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201 Varick Street

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Region III

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The Curtis Center

Suite 740 West

170 S. Independence Mall West

Philadelphia, PA 19106-3309

Telephone: (215) 861-4900

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SC,* TN*)

Atlanta Federal Center

61 Forsyth Street SW

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Region VI

(AR, LA, NM,* OK, TX)

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Region VII

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Region VIII

(CO, MT, ND, SD, UT,* WY*)

1999 Broadway, Suite 1690

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Guam, HI,* NV,* Trust

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San Francisco, CA 94015

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1111 Third Avenue

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Seattle, WA 98101-3212

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*These states and territories operate their own OSHA-approved job safety and health programs (Connecticut, New Jersey, and New York plans cover public employees only). States with approved programs must have a standard that is identical to, or at least as effective, as the federal standard.

